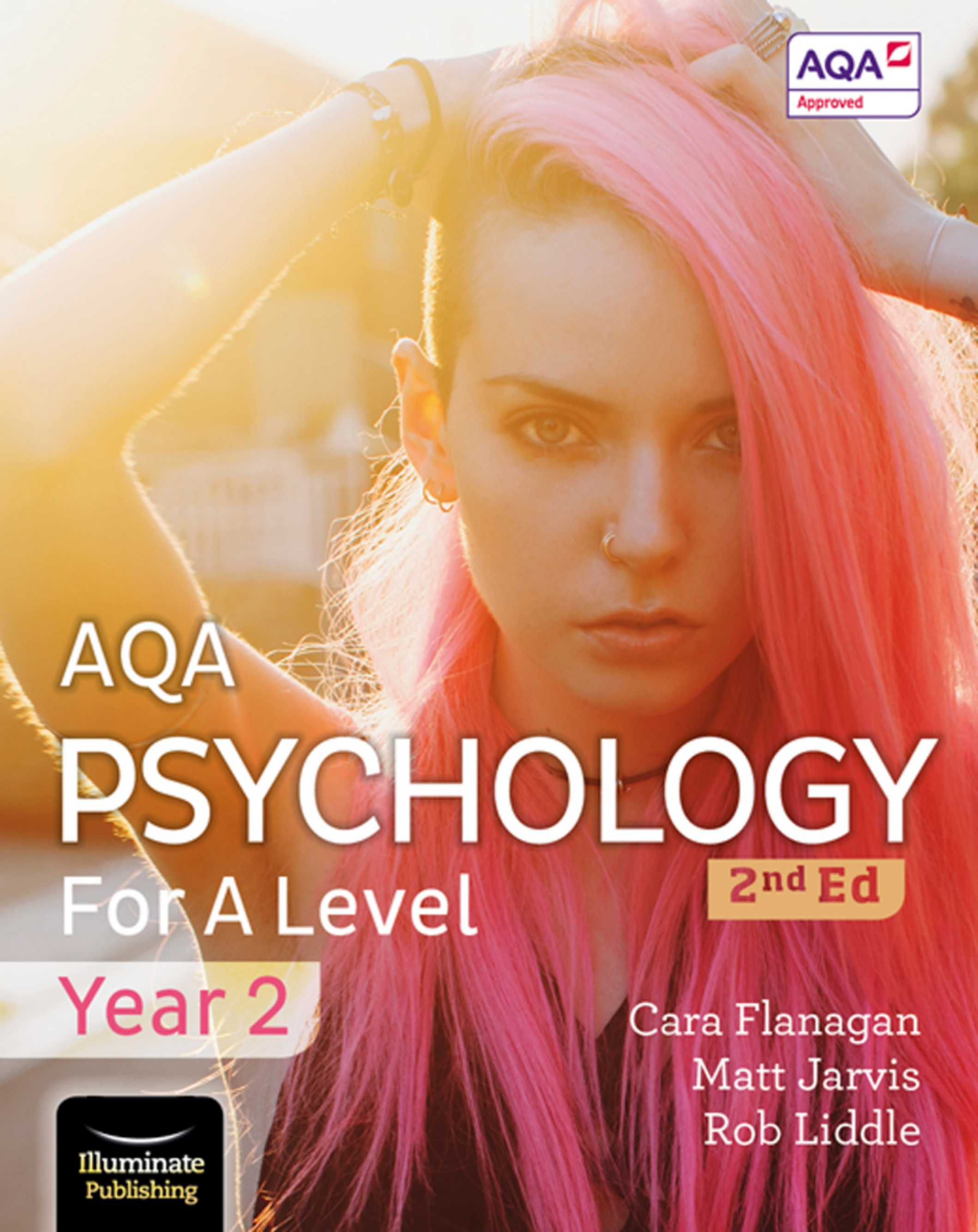

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Year 2
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A level course:

A level

- There are three papers.
- Each paper is 2 hours and 96 marks in total.
- Each paper is worth 33.3% of the final A level mark.

Paper 1 Introductory Topics in Psychology

Each section is worth 24 marks. All questions are compulsory.
Section A: Social influence
Section B: Memory
Section C: Attachment
Section D: Psychopathology

Paper 2 Psychology in Context

Sections A and B are worth 24 marks, Section C is worth 48 marks. All questions are compulsory.
Section A: Approaches in Psychology
Section B: Biopsychology
Section C: Research methods

Paper 3 Issues and Options in Psychology

Each section is worth 24 marks. Section A is compulsory, Sections B, C and D contain three topics each and students select one topic from each.
Section A: Issues and debates in Psychology
Section B: Relationships, Gender or Cognition and development
Section C: Schizophrenia, Eating behaviour or Stress
Section D: Aggression, Forensic psychology or Addiction

The topics highlighted in red are covered in our Year 1 book.

Research methods topics are also covered in the Year 1 book (AS content).

Note that about 25% of the overall assessment will assess skills in relation to research methods.

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How to use this book

Psychology assessment consists of three skills: describing what you know, applying your knowledge and analysing/evaluating this knowledge. This applies to all students – AS students and A level students.

On pages 387–397 we look at the skills needed for A level Psychology, which will help you to see why we have designed our spreads as they are.

What is an 'assessment objective' (AO)?

It is something that is used to assess your ability.

You can demonstrate what you know by describing it (AO1) but there is more to knowledge than that. There is the further skill of being able to use your knowledge in new situations (applying your knowledge, AO2). And a further skill is to be able to judge the value of your knowledge (evaluation, AO3).

All three of these skills are what you are examined on.

Describing what you know

Assessment objective 1 (AO1) is concerned with your ability to report detailed descriptions of psychological knowledge and demonstrate your understanding of this knowledge.

On most spreads in this book we have presented all the AO1 material on the left-hand side.

We have divided the text up with subheadings to help you organise your understanding. Each heading should act as a cue for material to recall and matches the material in the summary at the end of each chapter.

Applying your knowledge

Assessment objective 2 (AO2) is concerned with being able to apply your psychological knowledge.

It is a really good way to assess whether you do understand psychological knowledge.

On every spread we usually have two or three '**Apply it**' questions which give you a chance to practise this AO2 skill of application in relation to both concepts and research methods.

Research methods topics are covered in Chapter 3 but we have given you a chance to apply them throughout the book.

Analysing and evaluating

Assessment objective 3 (AO3) is concerned with your ability to evaluate the theories, concepts and studies you have learned about.

We have presented the AO3 material on the right-hand side of each spread.

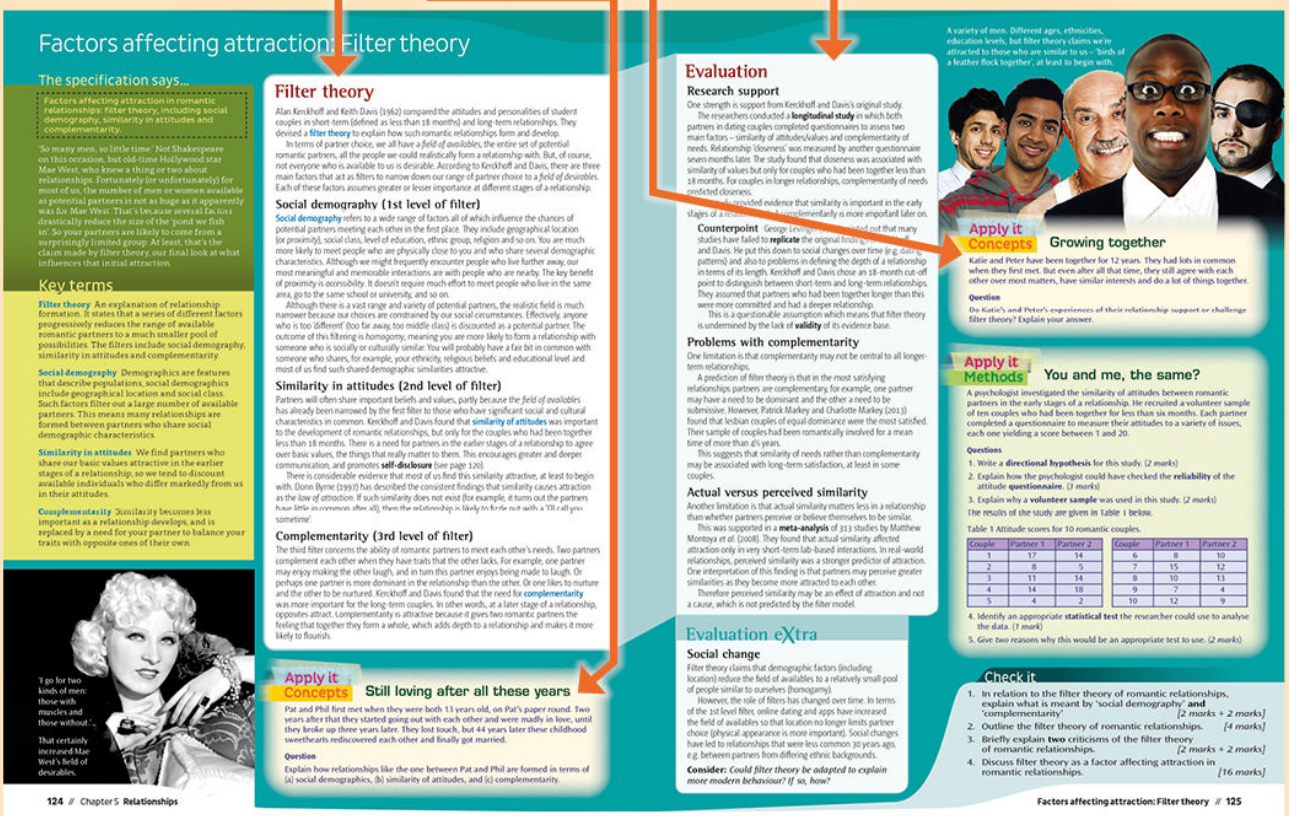
Generally we have provided:

- Two or three **evaluation points**. Each of these is divided into three paragraphs to help you understand how to structure evaluation using PET.
- One **counterpoint** – to help you develop the skill of *discussion*. Extended writing questions may say 'Discuss' which means you should present your evaluation points as a two-sided discussion (point and counterpoint).
- One **evaluation extra** – for those who want a bit more evaluation we offer a debate to consider. It is always preferable to include fewer points but really elaborate the ones you do, rather than trying to cover many poorly explained points. So this really is an 'extra'.

P – Identify the POINT to be made.

E – ELABORATE the point. Which can be done with an EXAMPLE, or some EVIDENCE from a research study or an EXPLANATION.

T – End with a link back to the essay title and/or give a conclusion: 'THIS suggests ...' 'THEREFORE ...' 'THIS means ...'.



Extra features on each spread

What the specification says

The spread begins (top left) with an excerpt from the specification showing you what is covered on the spread. There is also a brief analysis of what the specification entry means.

Definition of specification terms

The specification terms are explained, mirroring what you might be expected to know if you were asked to explain the terms. These key terms are emboldened in blue in the text.

Other important words are emboldened in the text and explained in the **glossary**, which forms part of the index.

Study tips

This book has been written by very experienced teachers and subject experts. When there is room they give you some of their top tips about the skills necessary to demonstrate your understanding of psychology. The study tips may also include pointers about typical misunderstandings.

Check it

A sample of practice questions is provided to help you focus on how you will be using the material on the spread.

The final question is an extended writing question. A level students need to answer 16-mark questions. Extended writing skills are discussed on pages 394–395.

Student digital book (SDB)

A digital version of this student book is also available if your school has access to our Digital Book Bundle of student and teacher resources. You can view this digital version via a tablet or computer at school, home or on the bus – wherever it suits you.

There are extra features in the student digital book that support your studies. For every spread in this book there are:

- **Lifelines**: Very straightforward, easy-to-digest key descriptive points for the spread topic.
- **Extensions**: Extra information, studies or activities to challenge and stretch you further.
- **Web links** to YouTube videos or other sites.
- **Answers** to the **Apply it** and **Evaluation extra** questions in this book (invaluable!).
- **Quizzes**: Interactive, self-marking quizzes that help to check and reinforce your understanding of a topic.
- **Practice questions**: Extra questions to help you practise your skills.



Extra features in each chapter

Chapter introduction

Each chapter begins with discussion points that might help you start thinking about the topic.

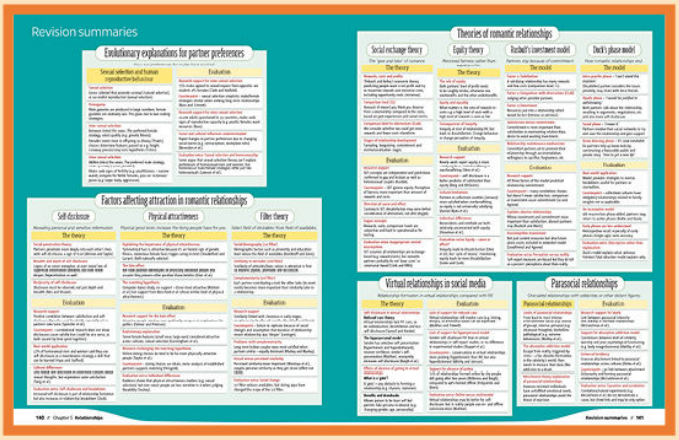
Practical corner

Questions on research methods account for about 25% of the assessment, therefore you should devote a lot of time to understanding how psychologists conduct research. There is no better way to do this than being a researcher yourself. We offer some ideas for research activities and provide additional opportunities to practise research methods and mathematical skills.

Chapter summary

Each chapter ends with a useful spread summarising the key points from each main content spread.

These summaries should help you revise. Look at each key point and see what you can remember. Look back at the spread to remind yourself. Each time you do this you should remember more.

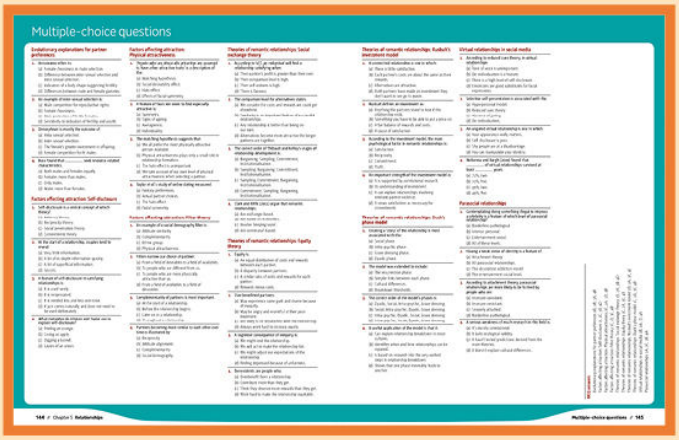


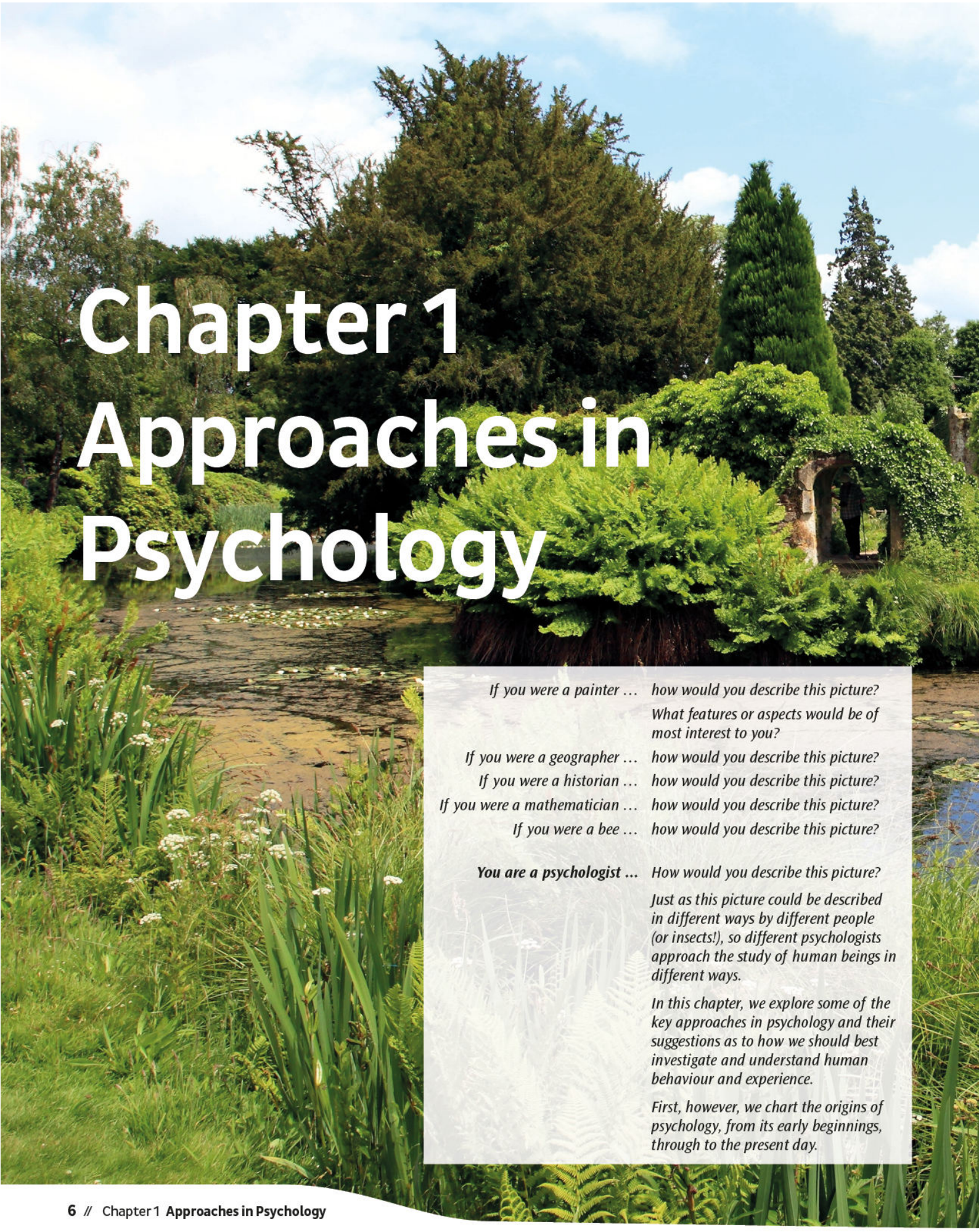
Practice questions, answers and feedback

Learning how to produce effective question answers is a SKILL. On this spread in each chapter we look at some typical student answers to practice questions. The comments provided indicate what is good and bad in each answer.

Multiple-choice questions (MCQs)

Here's a chance to test your new-found knowledge. Questions are given for each spread in the chapter, with answers at the bottom right of the multiple-choice questions spread. Keep trying until you get 100%.





Chapter 1 Approaches in Psychology

If you were a painter … *how would you describe this picture?*

What features or aspects would be of most interest to you?

If you were a geographer … *how would you describe this picture?*

If you were a historian … *how would you describe this picture?*

If you were a mathematician … *how would you describe this picture?*

If you were a bee … *how would you describe this picture?*

You are a psychologist … *How would you describe this picture?*

Just as this picture could be described in different ways by different people (or insects!), so different psychologists approach the study of human beings in different ways.

In this chapter, we explore some of the key approaches in psychology and their suggestions as to how we should best investigate and understand human behaviour and experience.

First, however, we chart the origins of psychology, from its early beginnings, through to the present day.



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Origins of Psychology

The specification says...

Origins of Psychology: Wundt, introspection and the emergence of Psychology as a science.

The idea of psychology as a distinct branch of study is generally dated at around 1880 when the first experimental lab was established.

That said, the philosophical roots of psychology stretch back much earlier than this. On this spread, we shall describe the work of the first ever experimental psychologist, as well as chart the emergence of psychology as a scientific discipline.

Key terms

Introspection The first systematic experimental attempt to study the mind by breaking up conscious awareness into basic structures of thoughts, images and sensations.

Psychology The scientific study of the mind, behaviour and experience.

Science A means of acquiring knowledge through systematic and objective investigation. The aim is to discover general laws.

Wundt and introspection

Wundt's lab

In 1879 Wilhelm Wundt opened the first ever lab dedicated entirely to psychological enquiry in a little town called Leipzig in Germany. Wundt's work is significant because it marked the beginning of *scientific* **psychology**, separating it from its broader philosophical roots. Wundt's aim was to try to analyse the nature of human consciousness, and thus represented the first systematic attempt to study the mind under controlled conditions. His pioneering method became known as **introspection**.

Standardised procedures

One of Wundt's main objectives was to try and develop theories about mental processes, such as language and perception. He and his co-workers recorded their experiences of various stimuli they were presented with, such as different objects or sounds. They would divide their observations into three categories: thoughts, images and sensations. For instance, participants might be given a ticking metronome and they would report their thoughts, images and sensations.

Structuralism

Isolating the *structure* of consciousness in this way is called **structuralism**. The stimuli that Wundt and his co-workers experienced were always presented in the same order and the same instructions were issued to all participants.

What we're gonna do right now is go back... back in time.

17th century – 19th century

Psychology is a branch of the broader discipline of philosophy. If psychology has a definition during this time it is as **experimental philosophy**.

1879

Wilhelm Wundt opens the first experimental psychology lab in Germany, and psychology emerges as a distinct discipline in its own right.

1900s

Sigmund Freud emphasises the influence of the unconscious mind on behaviour (the **psychodynamic approach**). He also develops his person-centred therapy, **psychoanalysis**, and shows that physical problems can be explained in terms of conflicts within the mind.

1913

John B. Watson writes *Psychology as the Behaviourist views it* and, later with **B.F. Skinner**, establishes the **behaviourist approach**. The psychodynamic and behaviourist approaches dominate psychology for the first half of the 20th century.

1950s

Carl Rogers and **Abraham Maslow** develop the **humanistic approach**, the so-called 'third force' in psychology, rejecting the behaviourist and the psychodynamic view that human behaviour is determined by outside factors. Humanistic psychologists emphasise the importance of self-determination and free will.

The emergence of Psychology as a science

What is **science**? Science involves building knowledge through systematic and objective (unbiased) measurement. The aim is to discover general laws. If psychology is a science (and most modern commentators would probably agree that it is), what has made psychology the science it is today?

1900s Behaviourists

By the beginning of the 20th century, the value of introspection was questioned by many, most notably the behaviourist John B. Watson. The problem was that introspection produced subjective data (rather than objective), so that it was very difficult to establish general laws. Watson, and later B.F. Skinner, proposed that a truly scientific psychology should only study phenomena that can be observed objectively and measured. For this reason, behaviourists focused on behaviours that they could see, and used carefully controlled experiments. The behaviourist approach would go on to dominate scientific psychology for the next 50 years.

1950s Cognitive approach

The digital revolution of the 1950s gave a new generation of psychologists a metaphor for studying the mind. Cognitive psychologists likened the mind to a computer (e.g. the **multi-store model**) and tested their predictions about memory and attention using experiments. The cognitive approach ensured that the study of the mind was, once again, a legitimate and highly scientific aspect of the discipline.

1980s Biological approach

In more recent times, the biological approach has taken scientific psychology to new levels. Researchers within this area have taken advantage of advances in technology to investigate physiological processes as they happen. An example of this is the use of sophisticated scanning techniques such as **fMRI** and **EEG** to study live activity in the brain. New methods (e.g. **genetic** testing) have also allowed us to better understand the relationship between genes and behaviour.

Evaluation

Scientific

One strength of Wundt's work is that some of his methods were systematic and well-controlled (i.e. scientific).

All introspections were recorded in the controlled environment of the lab, ensuring that possible **extraneous variables** were not a factor. As described on the left, procedures and instructions were carefully **standardised** so that all participants received the same information and were tested in the same way.

This suggests that Wundt's research can be considered a forerunner to later scientific approaches in psychology, such as the behaviourist approach.

Subjective data

One limitation is that other aspects of Wundt's research would be considered unscientific today.

Wundt relied on participants self-reporting their mental processes. Such data is subjective (influenced by a personal perspective). Also participants may have hidden some of their thoughts. It is difficult to establish meaningful 'laws of behaviour' from such data. And general laws are useful to predict future behaviour, one of the aims of science.

This suggests that some of Wundt's early efforts to study the mind were flawed and would not meet the criteria of scientific enquiry.

Evaluation eXtra

Wundt's contribution

Wundt produced the first academic journal for psychological research and wrote the first textbook! He is often referred to as the founder of modern psychology. It is even suggested that Wundt's pioneering research set the foundation for approaches that were to come, particularly the behaviourist approach and cognitive psychology.

Consider: *Does this justify the fact that his methods may have been unscientific?*

1950s

The introduction of the digital computer gives psychologists a metaphor for the operations of the human mind. The **cognitive approach** reintroduces the study of mental processes to psychology but in a much more scientific way than Wundt's earlier investigations.

1960s

Albert Bandura proposes the **social learning theory**. This approach draws attention to the role of cognitive factors in learning, providing a bridge between the newly established cognitive approach and traditional behaviourism.

1980s onwards

The **biological approach** begins to establish itself as the dominant scientific perspective in psychology. This is due to advances in technology that have increased understanding of the brain and biological processes.

Eve of the 21st century

Towards the end of the last century, **cognitive neuroscience** emerges as a distinct discipline bringing together the cognitive and biological approaches. Cognitive neuroscience investigates how biological structures influence mental states.

onwards



Evaluation

Modern Psychology

One strength is that research in modern psychology can claim to be scientific.

Psychology has the same aims as the natural sciences – to describe, understand, predict and control behaviour. The learning approaches, cognitive approach and biological approach all rely on the use of scientific methods, for example, lab studies to investigate theories in a controlled and unbiased way.

This suggests that throughout the 20th century and beyond, psychology has established itself as a scientific discipline.

Subjective data

One limitation with psychology is that not all approaches use objective methods.

The humanistic approach rejects the scientific approach, preferring to focus on individual experiences and subjective experience. The psychodynamic approach makes use of the case study method which does not use representative samples. Finally, the subject of study – human beings – are active participants in research, responding for example to **demand characteristics**.

Therefore a scientific approach to the study of human thought and experience may not always be desirable or possible.

Evaluation eXtra

Paradigm

The philosopher Thomas Kuhn said that any science must have a paradigm: a set of principles, assumptions and methods that all people who work within that subject agree on. He went on to say that psychology is not a science because it does not have a paradigm as there is so much internal disagreement at its core.

Consider: *Do psychologists generally 'disagree' with each other? What do you conclude about psychology as a science?*

Check it

1. Explain what Wundt meant by 'introspection'. *[3 marks]*
2. Briefly explain Wundt's role in the emergence of psychology as a science. *[4 marks]*
3. Discuss Wundt's contribution to psychology. *[8 marks]*
4. Outline **and** evaluate the emergence of psychology as a science. *[8 marks]*

Learning approaches: The behaviourist approach

The specification says...

Learning approaches: i) The behaviourist approach, including classical conditioning and Pavlov's research, operant conditioning, types of reinforcement and Skinner's research.

The behaviourist approach emerged at the beginning of the 20th century and became the dominant approach in psychology for half of that century.

It is also credited as being the driving force in the development of psychology as a scientific discipline.

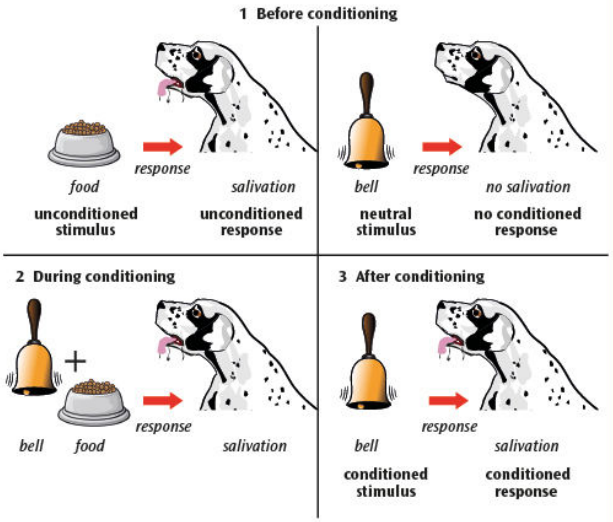
Key terms

Behaviourist approach A way of explaining behaviour in terms of what is observable and in terms of learning.

Classical conditioning Learning by association. Occurs when two stimuli are repeatedly paired together – an unconditioned (unlearned) stimulus (UCS) and a new 'neutral' stimulus (NS). The neutral stimulus eventually produces the same response that was first produced by the unconditioned (unlearned) stimulus alone.

Operant conditioning A form of learning in which behaviour is shaped and maintained by its consequences. Possible consequences of behaviour include reinforcement (positive or negative) and punishment.

Reinforcement A consequence of behaviour that increases the likelihood of that behaviour being repeated. Can be positive or negative.



Study tip

Often, students have difficulty explaining the distinction between negative reinforcement and punishment. Remember that negative reinforcement *increases* the likelihood of a behaviour being repeated (because it avoids an unpleasant consequence). In contrast, punishment *decreases* the likelihood of a behaviour being repeated (because of its unpleasant consequence).

The behaviourist approach

Assumptions

The **behaviourist approach** is only interested in studying behaviour that can be observed and measured. It is not concerned with investigating mental processes of the mind because these were seen as irrelevant. Early behaviourists such as John B. Watson (1913) rejected **introspection** as it involved too many concepts that were vague and difficult to measure. As a result, behaviourists tried to maintain more control and objectivity within their research and relied on **lab studies** as the best way to achieve this.

Behaviourists believe that all behaviour is learned. They describe a baby's mind as a 'blank slate' and this is written on by experience. Following Darwin, behaviourists suggested that the basic processes that govern learning are the same in all species. This meant that in behaviourist research, animals replace humans as experimental subjects. Behaviourists identified two important forms of learning: **classical conditioning** and **operant conditioning**.

Classical conditioning – Pavlov's research

Classical conditioning is learning through *association* and was first demonstrated by Ivan Pavlov (1927). Pavlov showed how dogs could be conditioned to salivate to the sound of a bell if that sound was repeatedly presented at the same time as they were given food. Gradually, Pavlov's dogs learned to *associate* the sound of the bell (a stimulus) with the food (another stimulus) and would produce the salivation response every time they heard the sound.

Thus, Pavlov was able to show how a **neutral stimulus**, in this case a bell, can come to elicit a new learned response (**conditioned response**) through association (see diagram left).

Operant conditioning – Skinner's research

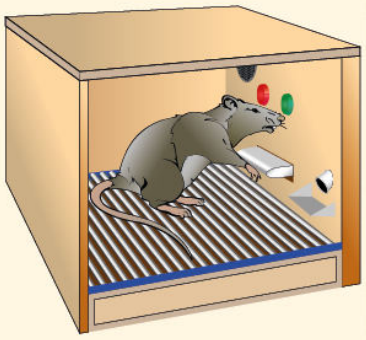
B.F. Skinner (1953) suggested that learning is an active process whereby humans and animals *operate* on their environment. In operant conditioning behaviour is shaped by its *consequences*:

- **Positive reinforcement** is receiving a reward when a certain behaviour is performed, for example, praise from a teacher for answering a question correctly in class.
- **Negative reinforcement** occurs when an animal (or human) avoids something unpleasant. The outcome is a positive experience. For example, when a student hands in an essay so as not to be told off, the avoidance of something unpleasant is the negative reinforcement. Similarly, a rat may learn through negative reinforcement that pressing a lever leads to avoidance of an electric shock (below).
- **Punishment** is an unpleasant consequence of behaviour, for example being shouted at by the teacher for talking during a lesson. (Finding a way to avoid that would be negative reinforcement.)

Positive and negative reinforcement increase the likelihood that behaviour will be repeated. Punishment decreases the likelihood that behaviour will be repeated.

Apply it Concepts

The Skinner box



(A) Skinner conducted experiments with rats, and sometimes pigeons, in specially designed cages called *Skinner boxes*. Every time the rat activated a lever (or pecked a disc in the case of the pigeon) within the box it was rewarded with a food pellet. From then on the animal would continue to perform the behaviour.

(B) Skinner also showed how rats and pigeons could be conditioned to perform the same behaviour to avoid an unpleasant stimulus, for example an electric shock.

Questions

1. Which aspect of operant conditioning does paragraph A illustrate?
2. Which aspect of operant conditioning does paragraph B illustrate?

Evaluation

Well-controlled research

One strength of the behaviourist approach is that it is based on well-controlled research.

Behaviourists focused on the measurement of observable behaviour within highly controlled lab settings. By breaking down behaviour into basic stimulus–response units, all other possible extraneous variables were removed, allowing cause-and-effect relationships to be established. For instance, Skinner was able to clearly demonstrate how reinforcement influenced an animal's behaviour.

This suggests that behaviourist experiments have scientific credibility.

Counterpoint However, the problem with this is that behaviourists may have oversimplified the learning process. By reducing behaviour to such simple components, behaviourists may have ignored an important influence on learning – that of human thought. Other approaches, such as **social learning theory** (next spread) and the **cognitive approach** (page 14) have drawn attention to the mental processes involved in learning.

This suggests that learning is more complex than observable behaviour alone, and that private mental processes are also essential.

Real-world application

Another strength of the behaviourist approach is that the principles of conditioning have been applied to real-world behaviours and problems.

For example, operant conditioning is the basis of **token economy systems** that have been used successfully in institutions, such as prisons and psychiatric wards. These work by rewarding appropriate behaviour with tokens that can be exchanged for privileges. For an example of how classical conditioning has been applied to the treatment of phobias, see Year 1 book page 148.

This increases the value of the behaviourist approach because it has widespread application.

Environmental determinism

One limitation of the behaviourist approach is that it sees all behaviour as conditioned by past conditioning experiences.

Skinner suggested that everything we do is the sum total of our reinforcement history. When something happens we may think 'I made the decision to do that' but, according to Skinner, our past conditioning history determined the outcome. This ignores any possible influence that **free will** may have on behaviour (Skinner himself said that free will is an illusion).

This is an extreme position and ignores the influence of conscious decision-making processes on behaviour (as suggested by the cognitive approach).

Evaluation eXtra

Ethical issues

Although procedures such as the Skinner box allowed behaviourists to maintain a high degree of control over their experimental 'subjects', many have questioned the ethics of conducting such investigations. Animals were housed in harsh, cramped conditions and deliberately kept below their natural weight so they were always hungry.

Consider: *Does what we learn from studies such as the Skinner box justify the way the animals were treated?*

Apply it Concepts — Behaviourism and gambling

Skinner discovered that if an animal was rewarded every time it activated the lever or pecked the disc, the conditioned behaviour would quickly die out (become extinct) as the animal was *satiated* (full of food pellets!).

It was revealed that a variable ratio schedule would prolong the behaviour and was most resistant to extinction. Here, reinforcement is given after an unpredictable (variable) number of responses are produced, for example, every 10, 15, 12, etc., times the lever is pressed.

This has been applied to a number of forms of human behaviour, including gambling addiction.

Question

Explain how addiction to gambling could be explained by the principles above.



How could the urge to shoot zombies in a video game be explained by operant conditioning?

Apply it Concepts — Behaviourism and gaming

David Wong (2008) has used Skinnerian principles to explain addiction to video games in his article *5 creepy ways video games are trying to get you addicted*. His argument is that the video game environment is a form of Skinner box providing reinforcement that is dependent on certain behaviours. For instance, shooting zombies in the example above leads to successful completion of a level, a high score, etc.

The use of the lever or joystick in many video games, it is argued, is analogous to the behaviour exhibited by the rat in the Skinner box, and the success and addictive nature of many early video games, such as Pac-Man, is explained by the fact that the central character navigates its way around the screen literally munching on food pellets!

Question

How could video game addiction be explained using behaviourist principles?

Check it

1. Briefly outline what the behaviourist approach means by 'classical conditioning'. *[2 marks]*
2. Outline **two** types of reinforcement as suggested by the behaviourist approach. *[4 marks]*
3. Outline **and** evaluate the behaviourist approach in psychology. *[16 marks]*

Learning approaches: Social learning theory

The specification says...

Learning approaches: ii) Social learning theory including imitation, identification, modelling, vicarious reinforcement, the role of mediational processes and Bandura's research.

Albert Bandura proposed social learning theory as a development of the behaviourist approach. He argued that classical and operant conditioning could not account for all human learning – there are important mental processes that mediate between stimulus and response.

Key terms

Social learning theory A way of explaining behaviour that includes both direct and indirect reinforcement, combining learning theory with the role of cognitive factors.

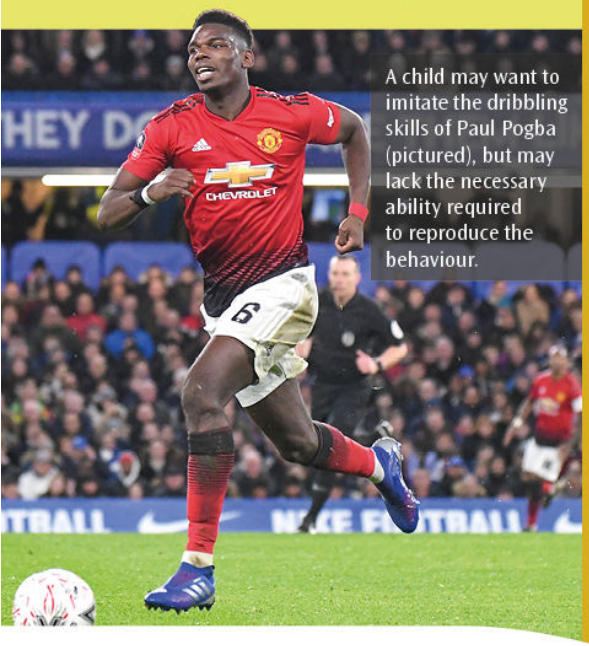
Imitation Copying the behaviour of others.

Identification A desire to be associated with a particular person or group often because the person/group possesses certain desirable characteristics.

Modelling From an observer's perspective, modelling is imitating the behaviour of a role model. From the role model's perspective, modelling is the precise demonstration of a specific behaviour that may then be imitated by an observer.

Vicarious reinforcement Reinforcement which is not directly experienced but occurs through observing someone else being reinforced for a behaviour. This is a key factor in imitation.

Mediational processes Cognitive factors (i.e. thinking) that influence learning and come between stimulus and response.



A child may want to imitate the dribbling skills of Paul Pogba (pictured), but may lack the necessary ability required to reproduce the behaviour.

Social learning theory

Assumptions

Albert Bandura agreed with the **behaviourists** that behaviour is learned from experience. However, his **social learning theory** (SLT) proposed a different way in which people learn – through observation and **imitation** of others (i.e. it is *social* – involving others). SLT suggested that learning occurs directly, through **classical** and **operant conditioning**, but also *indirectly*.

Vicarious reinforcement

For indirect learning to take place an individual observes the behaviour of others. The learner may imitate this behaviour but, in general, **imitation** only occurs if the behaviour is seen to be rewarded (reinforced) rather than punished, i.e. **vicarious reinforcement** occurs (see study by Bandura and Walters in Apply it below). Thus, the learner observes a behaviour but most importantly also observes the consequences of a behaviour.

The role of mediational processes

SLT is often described as the 'bridge' between behaviourist **learning theory** (previous spread) and the **cognitive approach** (next spread) because it focuses on how mental (cognitive) factors are involved in learning. These mental factors mediate (i.e. intervene) in the learning process to determine whether a new response is acquired. Four mental or **mediational processes** in learning were identified by Bandura:

1. *Attention* – the extent to which we notice certain behaviours.
2. *Retention* – how well the behaviour is remembered.
3. *Motor reproduction* – the ability of the observer to perform the behaviour.
4. *Motivation* – the will to perform the behaviour, which is often determined by whether the behaviour was rewarded or punished.

The first two of these relate to the *learning* of behaviour and the last two to the *performance* of behaviour. Unlike traditional behaviourism, the learning and performance of behaviour need not occur together. Observed behaviours may be stored by the observer and reproduced at a later time.

Identification

People (especially children) are more likely to imitate people they identify with, a process called **identification**. The person they identify with is called a *role model* and the process of imitating a role model is called **modelling** (note: the behaviour of a role model is also called *modelling*).

A person becomes a role model if they are seen to possess similar characteristics to the observer and/or are attractive and have high status. Role models may not necessarily be physically present in the environment, and this has important implications for the influence of the media on behaviour (see facing page).

Apply it Concepts

Bandura's research

Study A: Bandura *et al.* (1961) recorded the behaviour of young children who watched an adult behave in an aggressive way towards a Bobo doll (see right). The adult hit the doll with a hammer and shouted abuse at it.



When these children were later observed playing with various toys, including a Bobo doll, they behaved much more aggressively towards the doll and the other toys than those who had observed a non-aggressive adult.

Question: Which aspect of SLT does study A illustrate?

Study B: Bandura, together with Richard Walters (Bandura and Walters 1963), showed videos to children where an adult behaved aggressively towards the Bobo doll. One group of children saw the adult praised for their behaviour (being told 'Well done'). A second group saw the adult punished for their aggression towards the doll, by being told off. The third group (**control group**) saw the aggression without any consequence.

When given their own Bobo doll to play with, the first group showed much more aggression, followed by the third group, and then the second.

Question: Which aspect of SLT does study B illustrate?

Practical activity on page 25

Evaluation

Cognitive factors

One strength of the social learning theory approach is that it recognises the importance of **cognitive** factors in learning.

Neither classical nor operant conditioning can offer an adequate account of learning on their own. Humans and animals store information about the behaviour of others and use this to make judgements about when it is appropriate to perform certain actions. As Bandura observed:

> *'Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what they do. From observing others one forms an idea of how new behaviours are performed, and on later occasions this coded information serves as a guide to action'* (Bandura 1977).

This suggests that SLT provides a more comprehensive explanation of human learning by recognising the role of mediational processes.

Counterpoint Despite this, SLT has been criticised for making too little reference to the influence of biological factors on social learning. Although Bandura claimed natural biological differences influenced our learning potential, he thought that learning itself was determined by the environment. However, recent research suggests that observational learning, of the kind Bandura was talking about, may be the result of **mirror neurons** in the brain, which allow us to empathise with and imitate other people.

This suggests that biological influences on social learning were under-emphasised in SLT.

Contrived lab studies

One limitation of social learning theory is that the evidence on which it is based was gathered through lab studies.

Many of Bandura's ideas were developed through observation of young children's behaviour in the lab. Lab studies are often criticised for their contrived nature where participants may respond to **demand characteristics**. It has been suggested, in relation to the Bobo doll research (bottom of facing page) that, because the main purpose of the doll is to strike it, the children were simply behaving in a way that they thought was expected.

This suggests that the research may tell us little about how children actually learn aggression in everyday life.

Real-world application

Another strength is that SLT principles have been applied to a range of real-world behaviours.

Social learning theory has the advantage of being able to explain cultural differences in behaviour. SLT principles, such as modelling, imitation and reinforcement, can account for how children learn from others around them, including the media, and this can explain how social/cultural norms are transmitted through particular societies. This has proved useful in understanding a range of behaviours, such as how children come to understand their gender role.

This increases the value of the approach as it can account for real-world behaviour.

Evaluation eXtra

Reciprocal determinism

Bandura emphasised **reciprocal determinism**, in the sense that we are not merely influenced by our external environment, but we also exert an influence upon it, through the behaviours we choose to perform. This element of choice suggests that there is some free will in the way we behave.

This contrasts with the behaviourist approach which denies the possibility of free will (see previous spread).

Consider: *Why is a less determinist position preferable?*

Apply it

Concepts Video nasties

Bandura's Bobo doll experiments have implications for the media – are children, and indeed some adults, influenced by the violence and aggression they see on television, in movies and video games?

This debate was brought into sharp focus in 1990 following the death of James Bulger, a toddler from Liverpool murdered by two ten-year-old boys. At the time it was argued by many UK newspapers that the child killers were inspired by the horror film *Child's Play 3*, and there were calls for rules and censorship on such 'video nasties' to be tightened.

However, many researchers dispute the link between the media and real-world violence. For example, Guy Cumberbatch *et al.* (2001) argues that supposed 'video nasties', of the type cited in the Bulger case, are much more likely to frighten children than to make them frightening (aggressive) towards others. He argues that isolated incidents such as these are better explained by other factors such as social deprivation, child abuse and early exposure to violence in the home.

Questions

1. Using social learning principles, explain why media (such as violent videos) may potentially have a negative impact on children's behaviour.
2. How might the media vicariously reinforce violence and aggression?



Stanley Kubrick withdrew his controversial 1971 film *A Clockwork Orange* from British cinemas after a series of 'copycat' incidents based on scenes from the film.

Study tip

If you need to evaluate social learning theory you might, for example, use the Bobo doll studies (or other studies) to illustrate key points. However, you should keep descriptions of the procedures and findings within these studies to a minimum and instead make it clear how the implications/conclusions from these studies support (or contradict) key SLT concepts.

Check it

1. Outline what social learning theorists mean by 'identification'. *[2 marks]*
2. Explain **one** strength of social learning theory. *[3 marks]*
3. Outline **and** evaluate social learning theory. *[16 marks]*

The cognitive approach

The specification says...

> The cognitive approach: the study of internal mental processes, the role of schema, the use of theoretical and computer models to explain and make inferences about mental processes. The emergence of cognitive neuroscience.

The cognitive approach developed in the 1950s as a response to the behaviourists' failure to acknowledge mental processes. The development of the first computers gave cognitive psychologists a metaphor for describing mental processes.

Key terms

Cognitive approach The term 'cognitive' has come to mean 'mental processes', so this approach is focused on how our mental processes (e.g. thoughts, perceptions, attention) affect behaviour.

Internal mental processes 'Private' operations of the mind such as perception and attention that mediate between stimulus and response.

Schema A mental framework of beliefs and expectations that influence cognitive processing. They are developed from experience.

Inference The process whereby cognitive psychologists draw conclusions about the way mental processes operate on the basis of observed behaviour.

Cognitive neuroscience The scientific study of those biological structures that underpin cognitive processes.

Apply it Methods — Problem-solving

A cognitive psychologist carried out an experiment into the effects of other people on problem-solving. An independent groups design was used. In Condition A, 15 children were given 30 problems each to solve in two hours. The children completed the task in the same room and were allowed to talk to each other. In Condition B, a different group of 15 children were given the same problems and the same time to solve them but worked in silence.

The number of problems solved in Condition A was 204; the number of problems solved in Condition B was 324.

Questions

1. What percentage of the total number of problems solved were solved in Condition B? (*2 marks*)
2. Calculate the **mean** number of problems solved per child in Condition A and Condition B. (*2 marks*)
3. Sketch a suitable graphical display to represent the mean number of problems solved per child in Condition A and Condition B. (*3 marks*)
4. Explain *one* conclusion that can be drawn from the mean number of problems solved per child in Condition A and Condition B. (*2 marks*)

The cognitive approach

Assumptions

In direct contrast to the **behaviourist approach**, the **cognitive approach** argues that **internal mental processes** can, and should, be studied scientifically. As a result, the cognitive approach has investigated those areas of human behaviour that were neglected by behaviourists, such as memory, perception and thinking. These processes are 'private' and cannot be observed, so cognitive psychologists study them *indirectly* by making **inferences** about what is going on inside people's minds on the basis of their behaviour.

The role of schema

Cognitive processing can often be affected by a person's beliefs or expectations, which are often referred to as **schema**. Schema are 'packages' of ideas and information developed through experience. They act as a mental framework for the interpretation of incoming information received by the cognitive system. For example, you have a schema for a chair – something with legs that you can sit on. That's a package of information learned through experience that helps you to respond to the object appropriately.

Babies are born with simple motor schema for innate behaviours such as sucking and grasping. For example, the grasping schema consists of moving a hand towards an object and shaping the hand around the object in co-ordination with visual input.

As we get older, our schema become more detailed and sophisticated. Adults have developed mental representations for everything from the concept of psychology to a schema for what happens in a restaurant or what a typical zombie looks like.

Schema enable us to process lots of information quickly and this is useful as a sort of mental shortcut that prevents us from being overwhelmed by environmental stimuli. However, schema may also distort our interpretations of sensory information, leading to perceptual errors (see examples on facing page).

Theoretical and computer models

Cognitive psychologists use both **theoretical** and **computer models** to help them understand internal mental processes. In reality there are overlaps between these two models but basically theoretical models are abstract whereas computer models are concrete things.

One important theoretical model is the **information processing approach**, which suggests that information flows through the cognitive system in a sequence of stages. These include input, storage and retrieval, as in the **multi-store model** (see Year 1 book page 48). This information processing approach is based on the way that computers function but a computer model would involve actually programming a computer to see if such instructions produce a similar output to humans. If they do we can suggest that similar processes are going on in the human mind. Such computational models of the mind have proved useful in the development of 'thinking machines' or **artificial intelligence** (e.g. machines that can have a conversation with you).

The emergence of cognitive neuroscience

Cognitive neuroscience is the scientific study of the influence of brain structures on mental processes. Mapping brain areas to specific cognitive functions has a long history in psychology. As early as the 1860s Paul Broca had identified how damage to an area of the **frontal lobe** (which came to be known as **Broca's Area**) could permanently impair speech production.

It is only in the last twenty-five years, however, with advances in brain imaging techniques such as **fMRI** and **PET** scans, that scientists have been able to systematically observe and describe the **neurological** basis of mental processes. For example, in research involving tasks that required the use of **episodic** and **semantic memory**, Buckner and Petersen (1996, see Year 1 book page 51) were able to show how these different types of **long-term memory** may be located on opposite sides of the **prefrontal cortex**. As well as this, the system in overall charge of **working memory** – the **central executive** – is thought to reside in a similar area (Braver *et al.* 1997).

Scanning techniques have also proved useful in establishing the neurological basis of some mental disorders. On page 154 of our Year 1 book the link between the **parahippocampal gyrus** and **OCD** is discussed. It appears to play a role in processing unpleasant emotions.

The focus of cognitive neuroscience has expanded recently to include the use of computer-generated models that are designed to 'read' the brain. This has led to the development of mind-mapping techniques known as 'brain fingerprinting'. One possible future application of this could be to analyse the brain wave patterns of **eyewitnesses** to determine whether they are lying in court!

Evaluation

Scientific methods

One strength of the cognitive approach is that it uses objective, scientific methods.

Cognitive psychologists employ highly controlled and rigorous methods of study so researchers are able to *infer* cognitive processes at work. This has involved the use of **lab studies** to produce reliable, objective data. In addition, the emergence of **cognitive neuroscience** has enabled the two fields of biology and cognitive psychology to come together to enhance the scientific basis of study.

This means that the study of the mind has a credible scientific basis.

Counterpoint As cognitive psychology relies on the inference of mental processes, rather than direct observation of behaviour, it can occasionally suffer from being too abstract and theoretical in nature. Similarly, research studies of mental processes are often carried out using artificial stimuli (such as tests of memory involving word lists) that may not represent everyday experience.

Therefore, research on cognitive processes may lack **external validity**.

Real-world application

Another strength of the cognitive approach is that it has practical application.

The cognitive approach is probably the dominant approach in psychology today and has been applied to a wide range of practical and theoretical contexts. For example, cognitive psychology has made an important contribution in the field of artificial intelligence (AI) and the development of 'thinking machines' (robots). These are exciting advances that may revolutionise how we live in the future. Cognitive principles have also been applied to the treatment of depression (see Year 1 book pages 152–153) and improved the reliability of eyewitness testimony (see Year 1 book pages 58–63).

This supports the value of the cognitive approach.

Machine reductionism

One limitation of the cognitive approach is that it is based on **machine reductionism**.

There are similarities between the human mind and the operations of a 'thinking machine' such as a computer (inputs and outputs, storage systems, use of a central processor). However, the computer analogy has been criticised. Such machine reductionism ignores the influence of human emotion and motivation on the cognitive system, and how this may affect our ability to process information. For instance, research has found that human memory may be affected by emotional factors, such as the influence of anxiety on eyewitnesses (see Year 1 book pages 60–61).

This suggests that machine reductionism may weaken the validity of the cognitive approach.

Evaluation eXtra

Soft determinism

The cognitive approach is founded on **soft determinism**, i.e. the view that human behaviour may be determined by internal and external factors but we also can exert our free will at times. The **hard determinism** view says all our behaviour is determined by factors other than our will, such as conditioning and genes.

Consider: *Why is the cognitive approach a more flexible position than the behaviourist approach?*





Misperceived song lyrics
Did Celine Dion really sing 'The hot dogs go on' on the 1997 *Titanic* movie soundtrack? A case of schema distorting our interpretations of sensory information, leading to perceptual errors.

Apply it
Concepts

The influence of schema on perception

1. Read the following paragraph: *The Pschyology of Zombeis*

Evrey gnereation gtes the mosnter it deserevs as the reprsenetaiton of its depeest faers. Tdoay's zombeis, who are usulaly infetced in thier thuosands, repersent our modren faer of contaiguos disesaes, uncnotrolled medcial techonolgoy and socail colalpse. Zombeis are lniked, in our cutlure, with daeth and we probalby evovled to aviod daed and disesaed bodeis to aviod infcetoin', accrodnig to Lynn Alden, a profsesor of pschyology at the Univesrity of Britsih Colmobia. 'But its one thnig to aviod a corspe that ins't movnig and qiute anotehr wehn tehy strat chasnig you!'

Question

Explain the role of schema in helping you make sense of the information above.

2. Many people misread the following sentences.



Question

Explain the role of schema in the misperception of the sentences above.

3. Bugelski and Alampay (1962) The rat-man

Two groups of participants were shown a sequence of pictures, either a number of different faces or a number of different animals. They were then shown the ambiguous figure of the 'rat-man' (below).



Participants who saw a sequence of faces were more likely to perceive the figure as a man, whereas participants who saw a sequence of animals were more likely to perceive the figure as a rat.

Question

Explain how the influence of schema may account for this.

Check it

1. Outline the emergence of cognitive neuroscience. *[4 marks]*
2. Briefly explain how theoretical **and** computer models are used in cognitive psychology to make inferences about mental processes. *[4 marks]*
3. Outline **and** evaluate the cognitive approach. *[16 marks]*

The biological approach

The specification says...

The biological approach: the influence of genes, biological structures and neurochemistry on behaviour. Genotype and phenotype, genetic basis of behaviour, evolution and behaviour.

The biological approach has always been important in psychology but in recent years has gained prominence due to advances in technology such as the development of brain scanning techniques and increased understanding of the genetic basis of behaviour.

Key terms

Biological approach A perspective that emphasises the importance of physical processes in the body such as genetic inheritance and neural function.

Genes They make up chromosomes and consist of DNA which codes the physical features of an organism (such as eye colour, height) and psychological features (such as mental disorder, intelligence). Genes are transmitted from parents to offspring, i.e. inherited.

Biological structure An arrangement or organisation of parts to form an organ, system or living thing.

Neurochemistry Relating to chemicals in the brain that regulate biological and psychological functioning.

Genotype The particular set of genes that a person possesses.

Phenotype The characteristics of an individual determined by both genes *and* the environment.

Evolution The changes in inherited characteristics in a biological population over successive generations.



The biological approach

Assumptions

The **biological approach** suggests that everything psychological is at first biological, so to fully understand human behaviour, we must look to **biological structures** and processes within the body. From a biological perspective, the mind lives in the brain – meaning that all thoughts, feelings and behaviour ultimately have a physical basis. This is in contrast to, say, the **cognitive approach** that sees mental processes of the mind as being separate from the physical brain.

The neurochemical basis of behaviour

Neurochemistry refers to the action of chemicals in the brain ('neural' refers to the brain). Much of our thought and behaviour relies on chemical transmission in the brain. This occurs using **neurotransmitters** (see synaptic transmission on page 36). An imbalance of neurochemicals in the brain has been implicated as a possible cause of mental disorder, for example low levels of the neurotransmitter **serotonin** in **OCD** and overproduction of **dopamine** in **schizophrenia**.

The genetic basis of behaviour

Psychological characteristics, such as intelligence, are inherited in the same way as height or eye colour. **Twin studies** are used to investigate whether certain psychological characteristics have a **genetic** basis. This is achieved by analysing **concordance rates** – the extent to which twins share the same characteristic. If a characteristic (musical ability, schizophrenia or whatever) is genetic we would expect all identical (**monozygotic**) twins to be concordant (they share 100% of the same genes). Whereas the same would not be true for non-identical (**dizygotic**) twins who share about 50% of the same genes. In both cases the environment is assumed to be constant.

Genotype and phenotype

A person's **genotype** is their actual genetic make-up, whereas **phenotype** is the way that genes are expressed through physical, behavioural and psychological characteristics. Despite having the same genes, the way identical twins' genes are expressed (the phenotype) is different – see also the example of **PKU** (see facing page). This illustrates what many biological psychologists would accept, that much of human behaviour depends upon an interaction between inherited factors (**nature**) and the environment (**nurture**).

Evolution and behaviour

The **evolution** of animals and plants is a fact. In the 19th century, Charles Darwin proposed a theory to explain this fact – the theory of **natural selection**. The main principle of this theory is that any genetically determined behaviour that enhances an individual's survival (and reproduction) will continue in future generations, i.e. be naturally selected. This happens in a similar way to a farmer deciding which animals to use for breeding – the farmer *selects* the ones who possess desirable characteristics. For example, if one of a farmer's cows has a high milk yield the farmer chooses this cow for further breeding so his stock of cows become progressively better milk producers.

In nature this selection takes place 'naturally' – no one 'decides', the selection occurs simply because some traits give the possessor certain advantages. The possessor is more likely to survive, reproduce and pass on these traits. If the individual survives but does not reproduce, the traits do not remain in the gene pool for successive generations.

Apply it
Concepts

Giraffes, long necks and Bowlby

When considering the long neck of the giraffe, the evolutionary argument (put forward by Darwin himself) is that its extra height gives the giraffe an advantage in obtaining food that would not be available to shorter-necked rivals. This advantage means that over millions of years longer-necked giraffes become more common. This is an example of how an animal has adapted *physically* in response to its environment. However, what psychologists are really interested in is the evolution of *behaviour*. Some examples of behaviours that are seen in humans and animals are:

- Memory – human memory evolved because it provided advantages.
- Attachment – Bowlby argued that attachment to a primary caregiver is adaptive.
- Mental disorder – some mental disorders, such as OCD, may have a genetic basis. Psychologists argue, therefore, that these genes must have some adaptive advantage.

Question

In each of the above examples, can you suggest what the adaptive advantages might be?

Practical activity on page 24

Evaluation

Real-world application

One strength of the biological approach is that it has real-world application.

Increased understanding of neurochemical processes in the brain is associated with the use of psychoactive drugs to treat serious mental disorders. For example, the biological approach has promoted the treatment of **clinical depression** using **antidepressant** drugs that increase levels of the neurotransmitter serotonin at **synapses** in the brain. Such drugs have been associated with the reduction of depressive symptoms.

This means that people with depression may be better able to manage their condition and live their lives in the community, rather than remain in hospital.

Counterpoint Although antidepressant drugs are successful for many patients, they do not work for everyone. For instance, a recent study by Andrea Cipriani *et al.* (2018) compared 21 antidepressant drugs and found wide variations in their effectiveness. Although most of the drugs were more effective than **placebos** in comparative trials, the researchers concluded that the effects of antidepressants, in general, were 'mainly modest'.

This challenges the value of the biological approach because it suggests that brain chemistry alone may not account for all cases of, for example, depression.

Scientific methods

Another strength of the approach is that it uses scientific methods of investigation.

In order to investigate the genetic and biological basis of behaviour, the biological approach makes use of a range of precise and highly objective methods. These include scanning techniques, such as **fMRIs** and **EEGs**. With advances in technology, it is possible to accurately measure physiological and neural processes in ways that are not open to bias.

This means that much of the biological approach is based on objective and reliable data.

Biological determinism

One limitation of the biological approach is that it is **determinist**.

The biological approach is determinist in that it sees human behaviour as governed by internal, genetic causes over which we have no control. However, we have already seen that the way in which an individual's genotype is expressed (phenotype – see facing page) is heavily influenced by the environment. Not even identical twins who share the same genes look the same and think the same. Also, a purely genetic argument becomes problematic when we consider things such as crime. Could a violent criminal, for instance, really excuse their actions by claiming their behaviour was controlled by a 'crime gene'?

This suggests that the biological view is often too simplistic and ignores the mediating effects of the environment.



My genes made me do it.

Evaluation eXtra

Natural selection

Critics of Darwin's work, such as Karl Popper, claim that it is not possible to falsify the theory of natural selection (a key criterion of science) as we cannot show evolution happening, we can only deduce it has taken place. However, others claim that the basic principles are supported by fossil records (e.g. showing dinosaurs changing into birds).

Consider: *To what extent is natural selection a substantiated theory?*

Study tip

If you are writing an essay on the biological approach, make sure you do not include too much description of biological structures and processes. An essay should be a concise overview of the approach itself.

Apply it Methods — Twin study

In a study of depression, a researcher investigated the genetic basis of the disorder. One way to do this is to compare concordance rates for identical twins (monozygotic) who have exactly the same genes with non-identical (dizygotic) twins who share about 50% of the same genes. Both kinds of twins grow up in similar environments. Concordance rates express the likelihood that a trait present in one twin is also found in the other twin.

The following mean concordance rates found by the researcher were:

Monozygotic (MZ) twins – 49%

Dizygotic (DZ) twins – 17%

Ordinary siblings – 9%

Questions

1. Is this a **lab**, **field**, **natural** or **quasi-experiment**? Explain your choice. (*2 marks*)
2. What type of **experimental design** has been used? Explain your answer. (*2 marks*)
3. Identify the **independent** and **dependent variables** within this experiment. (*2 marks*)
4. Explain what the findings above tell us about the genetic basis of depression. Refer to all *three* findings in your answer. (*3 marks*)

Apply it Concepts — PKU

Phenylketonuria (PKU) is a rare genetic disorder that can be detected in babies using a heel prick test. If left unchecked, PKU causes severe learning difficulties in those who carry the genotype. If detected early enough, however, the child can be placed on a restricted diet and will not go on to develop learning difficulties.

Questions

1. Explain how PKU illustrates the relationship between genotype and phenotype.
2. Do some further research yourself and identify another genetic condition that illustrates the relationship between genotype and phenotype.

Check it

1. Explain what is meant by 'evolution' in psychology. *[3 marks]*
2. Using an example, explain the difference between 'genotype' and 'phenotype'. *[4 marks]*
3. Outline **two** features of the biological approach. Explain **two** limitations of the biological approach. *[8 marks]*
4. Discuss the contribution of the biological approach to our understanding of human behaviour. *[16 marks]*

The psychodynamic approach

The specification says...

The psychodynamic approach: the role of the unconscious, the structure of personality, that is Id, Ego and Superego, defence mechanisms including repression, denial and displacement, psychosexual stages.

The psychodynamic approach is most closely associated with the work of Sigmund Freud (though several post-Freudians were influenced by and expanded upon many of Freud's ideas).

Key terms

Psychodynamic approach A perspective that describes the different forces (dynamics), most of which are unconscious, that operate on the mind and direct human behaviour and experience.

The unconscious The part of the mind that we are unaware of but which directs much of our behaviour.

Id Entirely unconscious, the Id is made up of selfish aggressive instincts that demand immediate gratification.

Ego The 'reality check' that balances the conflicting demands of the Id and the Superego.

Superego The moralistic part of our personality which represents the ideal self – how we ought to be.

Defence mechanisms Unconscious strategies that the Ego uses to manage the conflict between the Id and the Superego.

Psychosexual stages Five developmental stages that all children pass through. At each stage there is a different conflict, the outcome of which determines future development.

The psychodynamic approach

The role of the unconscious

Sigmund Freud suggested that the part of our mind that we know about and are aware of – the *conscious* mind – is merely the 'tip of the iceberg'. Most of our mind is made up of **the unconscious** – a vast storehouse of biological drives and instincts that has a significant influence on our behaviour and personality. The unconscious also contains threatening and disturbing memories that have been **repressed**, or locked away and forgotten (see 'Defence mechanisms' below). These can be accessed during dreams or through 'slips of the tongue' (what Freud referred to as **parapraxes**). An example of such a slip is calling a female teacher 'mum' instead of 'miss'.

Just bubbling under the surface of our conscious mind is the **preconscious** which contains thoughts and memories which are not currently in conscious awareness but we can access if desired.

The structure of personality

Freud described personality as 'tripartite', composed of three parts:

- The **Id** is the primitive part of our personality. It operates on the **pleasure principle** – the Id gets what it wants. It is a seething mass of unconscious drives and instincts. Only the Id is present at birth (Freud described babies as being 'bundles of Id'). Throughout life the Id is entirely selfish and demands instant gratification of its needs.
- The **Ego** works on the **reality principle** and is the mediator between the other two parts of the personality. The Ego develops around the age of two years and its role is to reduce the conflict between the demands of the Id and the Superego. It manages this by employing a number of **defence mechanisms** (see below).
- The **Superego** is formed at the end of the **phallic stage**, around the age of five. It is our internalised sense of right and wrong. Based on the **morality principle** it represents the moral standards of the child's same-gender parent and punishes the Ego for wrongdoing (through guilt).

Psychosexual stages

Freud claimed that child development occurred in five stages, see table below left. Each stage (apart from *latency*) is marked by a different conflict that the child must resolve in order to progress successfully to the next stage (see the 'Oedipus conflict' on the facing page). Any psychosexual conflict that is unresolved leads to **fixation** where the child becomes 'stuck' and carries certain behaviours and conflicts associated with that stage through to adult life.

Defence mechanisms

The Ego has a difficult job balancing the conflicting demands of the Id and the Superego but it does have help in the form of defence mechanisms. These are unconscious and ensure that the Ego is able to prevent us from being overwhelmed by temporary threats or traumas. However, they often involve some form of distortion of reality and as a long-term solution they are regarded as psychologically unhealthy and undesirable.

Psychosexual stages

Stage	*Description*	*Consequence of unresolved conflict*
Oral 0–1 years	Focus of pleasure is the mouth, mother's breast can be the object of desire.	Oral fixation – smoking, biting nails, sarcastic, critical.
Anal 1–3 years	Focus of pleasure is the anus. Child gains pleasure from withholding and expelling faeces.	Anal retentive – perfectionist, obsessive. Anal expulsive – thoughtless, messy.
Phallic 3–6 years	Focus of pleasure is the genital area.	Phallic personality – narcissistic, reckless.
Latency	Earlier conflicts are repressed.	
Genital	Sexual desires become conscious alongside the onset of puberty.	Difficulty forming heterosexual relationships.

There are many aspects of this stage theory that are clearly outdated.

Apply it
Concepts

Examples of defence mechanisms

Three defence mechanisms are listed in the table below with their definitions.

Repression	Forcing a distressing memory out of the conscious mind.
Denial	Refusing to acknowledge some aspect of reality.
Displacement	Transferring feelings from true source of distressing emotion onto a substitute target.

Question

Three examples of defence mechanisms in action are given below. Match each example to one defence mechanism listed in the table above.

A. Continuing to turn up for work even though you have been sacked.

B. An individual forgetting the trauma of their favourite pet dying.

C. Slamming the door after a row with your girlfriend/boyfriend.

Evaluation

Real-world application

One strength of the psychodynamic approach is that it introduced the idea of *psycho*therapy (as opposed to physical treatments).

Freud brought to the world a new form of therapy – psychoanalysis. This was the first attempt to treat mental disorders psychologically rather than physically. The new therapy employed a range of techniques designed to access the unconscious, such as dream analysis. Psychoanalysis claims to help clients by bringing their repressed emotions into their conscious mind so they can be dealt with. Psychoanalysis is the forerunner to many modern-day 'talking therapies', such as **counselling**, that have since been established.

This shows the value of the psychodynamic approach in creating a new approach to treatment.

Counterpoint Although Freudian therapists have claimed success for many clients with mild **neuroses**, psychoanalysis is regarded as inappropriate, even harmful, for people experiencing more serious mental disorders (such as **schizophrenia**). Many of the symptoms of schizophrenia, such as paranoia and delusional thinking, mean that those with the disorder have lost their grip on reality and cannot articulate their thoughts in the way required by psychoanalysis.

This suggests that Freudian therapy (and theory) may not apply to all mental disorders.

Explanatory power

Another strength of Freud's theory is its ability to explain human behaviour.

Freud's theory is controversial in many ways, and occasionally bizarre, but it has nevertheless had a huge influence on psychology and contemporary thought. Alongside behaviourism, the psychodynamic approach remained a key force in psychology for the first half of the 20th century and has been used to explain a wide range of phenomena including personality development, the origins of psychological disorders, moral development and gender identity. The approach is also significant in drawing attention to the connection between experiences in childhood, such as our relationship with our parents, and our later development.

This suggests that, overall, the psychodynamic approach has had a positive impact on psychology – and also on literature, art and other human endeavours.

Untestable concepts

One limitation of the psychodynamic approach is that much of it is untestable.

The philosopher of science Karl Popper argued that the psychodynamic approach does not meet the scientific criterion of **falsification**. It is not open to **empirical** testing (and the possibility of being disproved). Many of Freud's concepts (such as the Id and the **Oedipus complex**) are said to occur at an unconscious level, making them difficult, if not impossible, to test. Furthermore, his ideas were based on the subjective study of single individuals, such as Little Hans, which makes it difficult to make universal claims about human behaviour.

This suggests that Freud's theory was pseudoscientific (not a real science) rather than established fact.

Evaluation eXtra

Psychic determinism

The psychodynamic approach suggests that much of our behaviour is determined by unconscious conflicts rooted in childhood. Freud believed there is no such thing as an 'accident'. Even something as random as a 'slip of the tongue' is driven by unconscious forces and has deep meaning.

Critics claim this is an extreme view because it dismisses any possible influence of free will on behaviour.

Consider: *Do you agree that Freud's psychic determinism is too extreme?*

Apply it Concepts

Freud's case study of Little Hans and the Oedipus complex

In the phallic stage, Freud claimed that little boys develop incestuous feelings towards their mother and a murderous hatred for their rival in love – their father (the Oedipus complex). Fearing that their father will castrate them, boys repress their feelings for their mother and identify with their father, taking on his gender role and moral values.

Freud also suggested that girls of the same age experience penis envy: they desire their father – as the penis is the primary love object – and hate their mother (the Electra complex). Although Freud was less clear on the process in girls, they are thought to give up the desire for their father over time and replace this with a desire for a baby (identifying with their mother in the process).

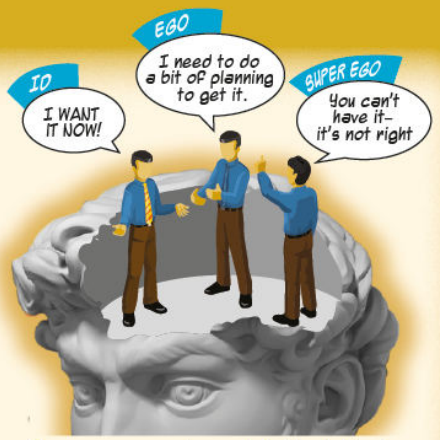
Freud supported his concept of the Oedipus complex with his case study of Little Hans. Hans was a five-year-old boy who developed a phobia of horses after seeing one collapse in the street. Freud suggested that Hans's phobia was a form of displacement in which his repressed fear of his father was transferred (displaced) onto horses. Thus, horses were merely a symbolic representation of Hans's real unconscious fear – the fear of castration experienced during the Oedipus complex.

Questions

1. Is the Little Hans case study good evidence for the Oedipus conflict? Explain your answer.
2. Is this a scientific way of investigating phobias? Explain your answer.
3. How might a behaviourist explain Hans's phobia of horses?

Apply it Concepts

Id, Ego and Superego



What would the Id, Ego and Superego suggest you do in the following situations?

1. You have missed lunch and are walking past a cake shop.
2. You are just leaving work and your boss asks you to stay an extra hour.
3. You are sitting on a bus and notice someone has left a wallet full of £50 notes.
4. You are driving home and another car pulls out in front of you nearly causing a collision.

Check it

1. Using an example, explain the 'role of the unconscious'. *[3 marks]*
2. Identify **one** Freudian defence mechanism **and** explain how it would affect behaviour. *[3 marks]*
3. Discuss the psychodynamic approach. Compare the psychodynamic approach with the cognitive approach. *[16 marks]*

Humanistic psychology

The specification says...

Humanistic psychology: free will, self-actualisation and Maslow's hierarchy of needs, focus on the self, congruence, the role of conditions of worth. The influence on counselling psychology.

Humanistic psychology emerged in the United States in the 1950s largely as a result of the work of Carl Rogers and Abraham Maslow. It became known as the 'third force' in psychology – alongside **behaviourist** and **psychodynamic** approaches – and represented a challenge to both. Rogers felt that Freud had dealt with the 'sick half' of psychology, so the humanistic approach concerned itself with explanations of 'healthy' growth in individuals.

Key terms

Humanistic psychology An approach to understanding behaviour that emphasises the importance of subjective experience and each person's capacity for self-determination.

Free will The notion that humans can make choices and their behaviour/thoughts are not determined by internal biological or external forces.

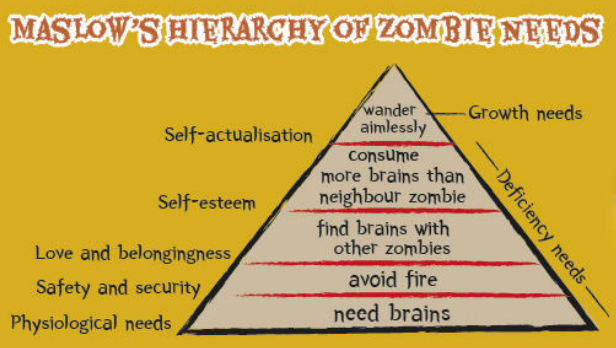
Self-actualisation The desire to grow psychologically and fulfil one's full potential – becoming what you are capable of.

Hierarchy of needs A five-levelled hierarchical sequence in which basic physiological needs (such as hunger) must be satisfied before higher psychological needs (such as self-esteem and self-actualisation) can be achieved.

Self The ideas and values that characterise 'I' and 'me' and includes perception and valuing of 'what I am' and 'what I can do'.

Congruence The aim of Rogerian therapy, when the self-concept and ideal self are seen to broadly accord or match.

Conditions of worth When a parent places limits or boundaries on their love of their children. For instance, a parent saying to a child, 'I will only love you if...you study medicine' or 'if you split up with that boy'.



Although it might be possible to apply the hierarchy of needs to zombies, Maslow argued that the need for self-actualisation is uniquely human.

Humanistic psychology

Free will

All the approaches we have considered so far are **determinist** to some degree in their suggestion that behaviour is entirely, or at least partly, shaped by forces over which we have no control. Even the **cognitive approach**, which claims we are free to choose our own thoughts, would still argue that such choice is constrained by the limits of our cognitive system. **Humanistic psychology** is quite different in this respect, claiming that human beings are essentially *self-determining* and have **free will**. People are still affected by external and internal influences, but are also active agents who can determine their own development.

For this reason, humanistic psychologists such as Rogers and Maslow, reject more scientific models that attempt to establish general principles of human behaviour. As active agents we are all unique, and psychology should concern itself with the study of subjective experience rather than general laws. This is often referred to as a *person-centred approach* in psychology.

Maslow's hierarchy of needs

Abraham Maslow was one of the founders of the humanistic movement in psychology. One of his main interests was in what motivates people. He described a **hierachy of needs** that motivate our behaviour. In order to achieve our primary goal of **self-actualisation**, a number of other deficiency needs must first be met. At the bottom (see diagram below left) are physiological needs such as food and water. Imagine you wanted to produce the best psychology essay you had ever written, this would be very difficult if you were hungry or tired.

Moving up the hierarchy, the next deficiency need is safety and security followed by love and belongingness and then **self-esteem**. A person is only able to progress through the hierarchy once the current need in the sequence has been met. At the top is self-actualisation.

Self-actualisation

Most people have an innate desire to achieve their full potential – to become the best they can possibly be. Self-actualisation represents the uppermost level of Maslow's hierarchy of needs. All four lower levels of the hierarchy ('deficiency needs') must be met before the individual can work towards self-actualisation (a 'growth need') and fulfil their potential. This applies to early development when a baby is first focused on physiological needs and applies throughout life.

Humanistic psychologists regard *personal growth* as an essential part of what it is to be human. Personal growth is concerned with developing and changing as a person to become fulfilled, satisfied and goal-orientated. Not everyone will manage this, however, and there are important psychological barriers that may prevent a person from reaching their potential.

The self, congruence and conditions of worth

Carl Rogers argued that for personal growth to be achieved an individual's concept of **self** (the way they see themselves) must be broadly equivalent to, or have **congruence** with, their **ideal self** (the person they want to be). If too big a gap exists between the two 'selves' the person will experience a state of incongruence and self-actualisation will not be possible due to the negative feelings of self-worth that arise from incongruence.

In order to reduce the gap between the self-concept and the ideal self, Rogers developed **dient-centred therapy** – also called 'counselling' (see facing page) to help people cope with the problems of everyday living. Rogers claimed that many of the issues we experience as adults, such as worthlessness and low self-esteem, have their roots in childhood and can often be explained by a lack of **unconditional positive regard** (or lack of *unconditional love*) from our parents. A parent who sets boundaries or limits on their love for their child (**conditions of worth**) by claiming *'I will only love you if...'* is storing up psychological problems for that child in the future. Thus, Rogers saw one of his roles as an effective therapist as being able to provide his clients with the unconditional positive regard that they had failed to receive as children.

Apply it

Concepts Self-actualisers

Maslow characterised life as a series of peak experiences – moments of great achievement, ecstasy or elation when all deficiency needs are satisfied. He also identified and researched a number of self-actualisers – people who, for whatever reason, were fulfilled in life and had used their abilities to the fullest.

Question

Can you think of any people, in the media or who you know, who could be described as self-actualisers? Explain your choices in each case.

Evaluation

Not reductionist

One strength of the humanistic approach is that it rejects attempts to break up behaviour and experience into smaller components (**reductionism**).

Behaviourists explain human and animal learning in terms of simple stimulus–response connections. Supporters of the cognitive approach see human beings as little more than information-processing 'machines'. Biological psychologists reduce behaviour to its basic physiological processes. Freud described the whole of personality as a conflict between three things: Id, Ego and Superego. In contrast, humanistic psychologists advocate **holism**, the idea that subjective experience can only be understood by considering the whole person.

This approach may have more validity than its alternatives by considering meaningful human behaviour within its real-world context.

Counterpoint Having said that, reductionist approaches may be more scientific. This is because the ideal of science is the **experiment**, and experiments reduce behaviour to **independent** and **dependent variables**. One issue with humanistic psychology is that, unlike behaviourism, there are relatively few concepts that can be broken down to single variables and measured.

This means that humanistic psychology in general is short on **empirical** evidence to support its claims.

Positive approach

Another strength of the humanistic approach is that it is optimistic.

Humanistic psychologists have been praised for bringing the person back into psychology and promoting a positive image of the human condition. Freud saw human beings as prisoners of their past and claimed all of us existed somewhere between 'common unhappiness and absolute despair'. In contrast, humanistic psychologists see all people as basically good, free to work towards the achievement of their potential and in control of their lives.

This suggests that humanistic psychology offers a refreshing and optimistic alternative to other approaches.

Cultural bias

One limitation of the approach is that it may be culturally-biased.

Many of the ideas that are central to humanistic psychology, such as individual freedom, autonomy and personal growth, would be much more readily associated with countries that have more **individualist** tendencies (e.g. the US). Countries with **collectivist** tendencies emphasise more the needs of the group and interdependence. In such countries, the ideals of humanistic psychology may not be as important as in others (e.g. self-actualisation).

Therefore, it is possible that this approach does not apply universally and is a product of the cultural context within which it was developed.

Evaluation eXtra

Limited application

Critics have argued that humanistic psychology has had relatively little impact in psychology – or little practical application in the real world (in comparison with other approaches, such as behaviourism or the biological approach). The approach has been described, not as a comprehensive theory, but as a loose set of abstract ideas.

On the other hand, Rogerian therapy revolutionised counselling techniques and Maslow's hierarchy of needs has been used to explain motivation, particularly in the workplace.

Consider: *Do you agree with the argument that the humanistic approach has had little impact?*

Counselling psychology

Rogers' client-centred (or latterly, *person-centred*) therapy is an important form of modern-day psychotherapy. It led to the general approach of **counselling** which is applied in many settings today (e.g. Samaritans and other helplines). Rogers referred to those in therapy as 'clients' rather than 'patients' as he saw the individual as the expert on their own condition. Thus, therapy is not directed by the therapist (non-directive), and the client is just encouraged towards the discovery of their own solutions within a therapeutic atmosphere that is warm, supportive and non-judgemental.

For Rogers, an effective therapist should provide the client with three things: genuineness, empathy and unconditional positive regard. The aim of Rogerian therapy is to increase the person's feelings of self-worth, reduce the level of incongruence between the self-concept and the ideal self, and help the person become a more fully functioning person.

Rogers' work transformed psychotherapy and introduced a variety of counselling techniques. In the UK and the US, similar counselling skills are practised, not only in clinical settings, but throughout education, health, social work and industry.

Client-centred therapy has been praised as a forward-looking and effective approach that focuses on present problems rather than dwelling on the past. However, much like psychoanalysis (see previous spread), it is best applied to the treatment of 'mild' psychological conditions, such as anxiety and low self-worth.

Apply it Concepts — Evaluating counselling

Question

Why would counselling be less effective in treating more serious mental disorders such as schizophrenia?

Apply it Concepts — Joyce: teacher or dancer?

Joyce is a successful teacher and is well-liked by her colleagues. However, Joyce has always dreamed of becoming a ballroom dancer. She spends much of her free time with her partner practising elaborate lifts, and can often be seen twirling around the classroom during break times.

Joyce is considering leaving teaching and becoming a professional dancer. Her colleagues have described Joyce's plans as 'ridiculous', and her parents, who are very proud of the fact that their daughter is a teacher, have told Joyce they will not speak to her again if she does. Joyce is beginning to feel sad and miserable.

Question

Referring to features of humanistic psychology, explain how Joyce's situation may affect her personal growth.

Study tip

One of the key influences on behaviour is culture. Psychologists have tried to categorise the main ways in which cultures influence behaviour, such as distinguishing between individualist and collectivist cultures (see left). The UK, the US, Australia and most European countries are regarded as individualist and also often described as industrialised and/or 'Western'. But because 'Western' is a bit of an outdated term, we have preferred to use either 'individualist' or 'industrialised'. However, things are rarely so simple and any attempt to divide the world into polar opposites cannot truly reflect the differences that exist between cultures (see discussion in the counterpoint on page 97).

Check it

1. Explain what humanistic psychologists mean by 'conditions of worth'. *[3 marks]*
2. Outline **and** briefly evaluate the influence of humanistic psychology on counselling. *[5 marks]*
3. Discuss Maslow's hierarchy of needs. Refer to self-actualisation in your answer. *[8 marks]*
4. Outline humanistic psychology. Compare humanistic psychology with the psychodynamic approach. *[16 marks]*

Comparison of approaches

The specification says...

Comparison of approaches.

In this chapter, we have considered six of the major psychological approaches. Here, we outline some of the areas of agreement, disagreement, contention and overlap between these different ways of viewing and explaining human behaviour. Our discussion is organised around five themes: views on development, nature versus nurture, reductionism, determinism, explanation and treatment of psychological disorders.

We also assess the benefits (and otherwise) of adopting an **eclectic approach** which aims to combine elements from different approaches.

Apply it

Concepts

Let's be friends: areas of overlap and agreement between approaches

Although there are many significant differences between the theories and assumptions within each approach, there are some areas of overlap and ways in which approaches complement each other.

You may recall how the social learning theory approach was described as a 'bridge' between the behaviourist and cognitive approaches because it emphasised the importance of learning from the environment as well as the role of mediating cognitive factors.

The fusion of cognitive and biological approaches has led to the development of cognitive neuroscience – a sophisticated field that links mental states to biological structures.

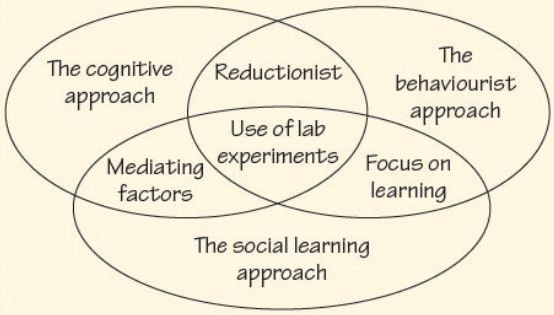
The psychodynamic approach shares much in common with the biological approach as both see biological drives and instincts as crucial determinants of human development.

Finally, humanistic and psychodynamic approaches can both be reasonably described as person-centred in the way that they place subjective experience at the centre of their research.

These are just some of the ways in which psychological approaches overlap.

Question

Select two or three approaches. Draw Venn diagrams (see example below) to show the ways in which these approaches overlap and intersect. Use this page and the rest of the chapter to draw out the features and assumptions that different approaches have in common.



An example of a Venn diagram.

Views on development

In terms of child development, the **psychodynamic approach** presents the most coherent theory of development, tying its concepts and processes to specific (psychosexual) stages that are determined by age. That said, Freud saw very little further development once a child enters the genital stage in the teen years.

Stage theories within the **cognitive approach** have contributed to our understanding of child development. For example, as part of their intellectual development, children form increasingly complex concepts (**schema**) as they get older.

Maturation is an important principle within the **biological approach** whereby genetically determined changes in a child's physiological status influence psychological and behavioural characteristics.

Humanistic psychologists see the development of the **self** as ongoing throughout life. However childhood is a particularly important period and a child's relationship with their parents is important in terms of **unconditional positive regard**.

Finally, the **behaviourist approach** and **social learning theory** do not offer coherent stage theories of development but instead see the processes that underpin learning as continuous, occurring at any age.

Nature versus nurture

The debate about whether human behaviour is more influenced by **inherited** biological factors (**nature**) or by the environment and experience (**nurture**) has a long history in psychology. The biological approach and the two learning approaches are furthest apart in this respect. Behaviourists characterised babies as 'blank slates' at birth and suggest that all behaviour comes about through learned associations, **reinforcement** contingencies or, in the case of social learning theory, observation and imitation. In contrast, the biological approach argues from a position that behaviour is the result of a **genetic** blueprint that we inherit from our parents (**genotype**), though the way it is expressed is influenced by the environment (**phenotype**).

Freud thought that much of our behaviour was driven by biological drives and instincts, but he also saw relationships with parents as playing a fundamental role in future development. Similarly, humanistic psychologists regard parents, friends and wider society as having a critical impact on the person's **self-concept**. Finally, although cognitive psychologists would recognise that many of our information processing abilities and schema are **innate**, they are constantly refined through experience.

Reductionism

Reductionism refers to the belief that human behaviour can be most effectively explained by breaking it down into constituent parts. The opposing view is **holism**, that phenomena are best understood by looking at the interplay and interaction of many different factors.

Behaviourism is reductionist in the sense that it breaks up complex behaviour into stimulus–response units for ease of testing in the **lab**. The biological approach is also reductionist in the way that it explains human behaviour and psychological states at the level of the gene or **neuron**. The psychodynamic approach reduces much of our behaviour to the influence of sexual drives and biological instincts, although Freud's argument that personality is a dynamic interaction between the three parts of the personality is often viewed as a more holistic explanation. The cognitive approach has been accused of **machine reductionism** by presenting people as information processing systems and ignoring the influence of emotion on behaviour. Like behaviourists, social learning theorists reduce complex learning to a handful of key processes (imitation, modelling, etc.) though they do at least place emphasis on cognitive factors that mediate learning, and how these interact with external influences.

Finally, and quite distinct from other approaches, is humanistic psychology, which formulates a holistic approach to understanding human behaviour. This involves investigating all aspects of the individual, including the effects of interaction with others and wider society.

Determinism

Determinism is often confused with reductionism but is quite distinct from it – though many determinist explanations are also reductionist. Determinism proposes that all behaviour has an internal or external cause and is thus predictable.

The behaviourist approach sees all behaviour as environmentally determined by external influences that we are unable to control (e.g. operant conditioning). The biological approach advocates a form of **genetic determinism** in its assumption that much of our behaviour is directed by innate influences. **Psychic determinism** is a key feature of the psychodynamic approach insofar as the **unconscious** forces that drive our behaviour are the ultimate cause of behaviour, and that these are simply rationalised by our conscious minds.

The positions described above are known as **hard determinism**, the next two approaches take a less all-or-nothing view (**soft determinism**). The cognitive approach suggests that we are the 'choosers' of our own thoughts and behaviours, yet these choices can only operate within the limits of what we know and have experienced. Social learning theorists, like Bandura, put forward the notion of **reciprocal determinism** – the idea that as well as being influenced by our environment, we also exert some influence upon it through the behaviours we choose to perform. Only humanistic psychology stands alone in its assertion that human beings have **free will** and operate as active agents who determine their own development.

Explanation and treatment of psychological disorders

The behaviourist model sees abnormality as arising from maladaptive or faulty learning in the sense that inappropriate or destructive patterns of behaviour have been reinforced. **Behaviour therapies**, such as **systematic desensitisation**, which aim to condition new, more healthy responses, have been applied successfully to the treatment of **phobias**.

Social learning theory has had relatively little application to treatment, but the principles of **modelling** and **observational learning** have been used to explain how negative behaviours such as aggression may be learned through the influence of dysfunctional **role models**.

Freud saw anxiety disorders as emerging from unconscious conflict, childhood trauma and the overuse of **defence mechanisms**. **Psychoanalysis** has had some success as a therapy but it is not appropriate for everyone because it requires a considerable input from the patient in terms of time and also ability to talk about and reflect on emotions.

Cognitive therapy is much more effective and applicable, especially when combined with behaviour therapy as **CBT** (for example in the treatment of **depression**). It aims to identify and eradicate faulty thinking which is assumed to be the root cause of maladaptive behaviour.

Also effective is humanistic therapy (or **counselling**) based on Rogers' philosophy that closing the gap between the self-concept and the ideal self will increase **self-esteem** and stimulate personal growth.

Finally, many would claim the biological approach has revolutionised the treatment of mental disorders through the development of **drug therapy** which regulates chemical imbalances in the brain.



To what extent is our behaviour dictated by forces beyond our control?

Apply it Concepts – Idiographic and nomothetic approaches

The six approaches are also divided in terms of whether they are attempting to establish general laws by studying large groups of people (nomothetic approach) or whether they are aiming to understand what makes individuals unique (idiographic approach). The former generally involves the use of the experimental method whereas the latter tends to be more concerned with in-depth qualitative methods such as case studies and unstructured interviews.

Broadly speaking, the more scientific approaches – behaviourist, social learning theory, cognitive and biological – subscribe to the experimental nomothetic approach. However, the biological and cognitive approaches often draw upon data derived from case studies, especially those involving individuals with unusual abnormalities or deficits (as in the case of HM in memory described in our Year 1 book on page 51) – a more idiographic approach. The person-centred approaches – psychodynamic and humanistic – are idiographic in that they favour the case study method, usually carried out within clinical settings.

Question

What are the strengths and limitations of adopting:

(a) An idiographic approach to human behaviour?

(b) A nomothetic approach to human behaviour?

Apply it Concepts – The eclectic approach

Many modern psychologists take a multidisciplinary approach to the study of human behaviour. Eclecticism in psychology refers to the combining of several approaches, methods and/or theoretical perspectives in order to provide a more comprehensive account of human behaviour.

Such an ethos has proved fruitful in the field of mental disorders. Combining treatment options from several different perspectives – such as drugs, cognitive therapy and family therapy – has led to more effective outcomes for people with schizophrenia and lower relapse rates (e.g. Stein and Test 1980).

Many topic areas in psychology have also benefitted from 'interactionist' theories that combine different levels of explanation. The diathesis-stress model in psychiatry accounts for the fact that many mental disorders are a complex interaction of biological predisposition and environmental triggers. Similarly, the biosocial approach rejects the traditional distinction between nature and nurture by explaining how basic biological differences are reinforced by the environment during gender development, for instance.

Question

Although there are obvious advantages associated with eclecticism in psychology, what issues/problems might such an approach present?

Study tip

You might enhance your understanding of the information on this spread by drawing a table with the six approaches across the top and the five themes covered on this spread down the side. Then summarise the information on this spread in relation to each approach.

Check it

1. Outline **one** way in which the behaviourist approach and social learning theory approach overlap. *[2 marks]*
2. Explain **two** differences between the cognitive approach and humanistic psychology. *[6 marks]*
3. Outline the biological approach. Compare the biological approach with the cognitive approach. *[16 marks]*

Practical corner

The specification says...

> Knowledge and understanding of ... research methods, practical research skills and maths skills. These should be developed through ... ethical practical research activities.

This means that you should conduct practical investigations wherever possible. Here, we suggest an idea for an experiment that you might conduct related to the biological approach, as well as a demonstration of electrical transmission in the nervous system. There is also a naturalistic observation linked to your knowledge of learning approaches.

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?

Practical idea 1: The effect of arousal on performance

Psychological anxiety affects biology, an example of the **biological approach**. The anxiety of performing in front of an audience causes physiological arousal (activation of the **autonomic nervous system**) and the release of **adrenaline**. This can improve performance on a simple or familiar task, which explains why athletes break records in front of an audience rather than in training. On difficult or unfamiliar tasks, however, people tend to become stressed leading to more errors and poorer performance.

The aim of this study is to see whether the physiological arousal caused by an audience affects performance on a simple task. This is a **laboratory experiment**.

The practical bit

Materials and basic design

The task participants will complete is straightforward – crossing out the letter 'e' from a passage of text as quickly as possible. The text needs to be long enough to keep participants occupied for a reasonable period of time, but not so long that they are there all day! There are a number of ways to assess the dependent variable. Probably the easiest way is simply to time how long participants take to complete the task. (You could also take into account any mistakes made, e.g. letter e's that they missed.)

All participants should complete the task alone and then with an audience of about three or four people. As this is a **repeated measures** design, the order of conditions should be **counterbalanced**.

Keep control

The only thing that should affect the **dependent variable** in this experiment (time taken to complete the task) is the **independent variable** (whether an audience is present or not). All other possible **extraneous variables** should be kept constant. For this reason, there should be strict **standardisation** of procedures for all participants. You should write a **briefing** statement, **standardised instructions** (for both conditions of the experiment) and a **debriefing**. These should take account of all relevant **ethical issues** (see left) and participants should be treated with respect.

It might be wise to inform participants at the beginning that they will be placed in a situation where their performance on a task will be observed by others, as some participants may be reluctant to continue. However, revealing the full aim of the investigation may be best left to the end as this could have some influence on how participants approach the tasks.

Which hypothesis?

On the face of it this looks a simple task, and evidence suggests that the arousing effects of an audience lead to improved performance when a task is easy. However, for some people, the distracting effects of the audience may lead to 'over-arousal' and poorer performance as a result (see the **Yerkes-Dodson Law** on page 60 of our Year 1 book). For this reason, we would recommend writing a **non-directional hypothesis** for this study.

Sampling

You will need to consider a suitable **sampling technique** for this study and you need to think about what would make an appropriate sample size.

Analysing your data

Finally, you should present your results in the form of tables and graphs so that the effect of arousal on performance can be seen. You could also use the **sign test** (see Year 1 book page 200) to analyse the data.

Table 1 Results for an experiment on the effects of arousal.
Condition A: Time in seconds to cross out e's without an audience.
Condition B: Time in seconds to cross out e's with an audience.

Participant	Condition A	Condition B
1	56	52
2	63	64
3	60	48
4	72	71
5	57	46
6	62	64
7	70	53
8	81	83
9	50	54
10	66	56
Totals		
Standard deviation	8.9573	11.4450

Apply it Methods

The maths bit 1

1. In Table 1, what percentage of participants improved their performance with an audience? (*1 mark*)
2. Using the data in Table 1, calculate the **mean** time it took to cross out letter e's in Condition A and B. (*2 marks*)
3. Explain *one* strength and *one* limitation of the mean as a **measure of central tendency**. (*2 marks + 2 marks*)
4. Sketch a suitable graph to represent the mean values calculated in question 2. (*3 marks*)
5. Give each **standard deviation** in the table on the left to one **decimal place**. (*1 mark*)
6. What do the standard deviations tell us about the spread of data in each condition? (*2 marks*)

Practical idea 2: Gender differences in adult-child play

The aim of this study is to see if there is a difference in the way that adults interact with their children depending on the child's gender.

Following **social learning theory**, are gender differences in children's play reinforced by the ways in which adults interact with children?

This is a **quasi-experiment** because gender is the independent variable. **Observational techniques** are used to collect data.

The practical bit

We have chosen a **naturalistic observation** as the most suitable method to collect data. It may be possible to simply ask parents or guardians, via a **questionnaire** or **interview**, what forms of play they prefer to engage in with their children but there may be a **social desirability bias** as parents may not want to appear gender-stereotypical in their answers (or look as if they don't play with their children at all!). Similarly, if parents know they are being observed within a controlled environment – as in a **laboratory** observation – they may change their normal behaviour due to the **demand characteristics** of the situation. Therefore, this study will take the form of a **covert observation** in a natural environment, in this case, a local park.

Is it ethical?

Covert observations are ethical as long as they involve *public* behaviour that would be happening anyway in the absence of the researcher. If it is not obvious that you are recording behaviour then there is no need to ask for **consent** or **debrief** your participants on this occasion.

Designing your observation

Perhaps you will simply record the type of play that the adults and children are engaged in, for instance 'playing football' or 'hide and seek'. Alternatively, you might want to categorise adult–child interaction as, say, 'active' or 'passive', in which case you will need a list of **behavioural categories** that specify the difference between the two. For instance, 'active play' may involve running around whereas 'passive play' may involve sitting and talking. Once these categories are drawn up, you can then record the **frequency** with which they occur.

You also need to determine the **sampling method** for the observation. Will you record the number of times behaviour occurs (**event sampling**) or record the behaviour of participants at specific time intervals (**time sampling**)? This may also affect *how* behaviour is recorded, that is, through written description or the use of a tally chart.

Will you work alone or with someone else?

Observations conducted by a single researcher may introduce **bias** so it might be a good idea to work with a partner. To this end, you might wish to conduct a **pilot study**, for instance of a family member or friend playing with their children, so you can assess the **reliability** of your observations with your co-researcher.

Whatever you decide, you will need to present your results in the form of tables and graphs to give an instant picture of the gender differences in play.



Try it

The speed of electrical transmission

Stand in a line with a bunch of your friends (or classmates) all holding hands. The person on one end of the line needs a stopwatch and the person on the other end of the line should hold a bicycle horn (the squeezy kind).

On the count of three the person with the watch should start the timer and squeeze the hand of the person next to them. That person then squeezes the hand of the person next to them, and so on. When the person holding the horn's hand is squeezed they should sound the horn and the timer is stopped. Bear in mind that you might need to practise a couple of times to get it right!

Do the same but this time hold the hand of the person on your left and touch the shoulder of the person on your right. Is the time from start to end now different from the holding-hands trial?

Now for the maths bit...

Measure the span from the tip of one person's right hand to the tip of their left hand for all the people in the group and calculate the total distance the signal travelled. Divide the distance travelled by the time the signal travelled to determine the speed in metres per second.

Scientists have estimated that the speed of electrical transmission across a large **myelinated axon** is around 200 metres per second.

How did you compare? Have another go and see if you can beat your time.

Apply it
Methods

The maths bit 2

1. Using the data in Table 2, calculate the total number of times active play was observed in adult–boy pairs and in adult–girl pairs. Do the same for passive play. (*2 marks*)
2. Draw a **bar chart** to show the difference in active play and passive play for adult–girl pairs and adult–boy pairs. (*3 marks*)
3. Explain *one* conclusion that can be drawn from the bar chart you have drawn. (*2 marks*)
4. Identify the type of data in Table 2. Explain *one* limitation of using this type of data. (*1 mark + 2 marks*)

Table 2 Data collected for frequency of active and passive play between adult–girl pairs and adult–boy pairs.

	Type of play					
	Active play			Passive play		
	Running	Shouting	Physical contact	Sitting	Talking	No physical contact
Adult–boy pair	11	8	5	3	2	3
Adult–girl pair	4	3	5	5	6	3

Revision summaries

Origins of Psychology

We're going to go back in time.

Wundt and introspection

Wundt's lab
First psychology lab in Leipzig, introduced introspection to study the human mind systematically (scientific).

Standardised procedures
Observations of objects and sounds are recorded.

Structuralism
Consciousness divided into three categories: thoughts, images, sensations (structuralism).

Evaluation

Scientific
Controlled environment, carefully standardised.

Subjective data
General laws not possible as all introspections are different.

Evaluation extra: Wundt's contribution
The founder of modern psychology.

The emergence of Psychology as a science

Science involves systematic and objective measurement to discover general laws.

1900s Behaviourists
Researchers (e.g. Watson and Skinner) conducted controlled experiments on behaviours that were directly observable.

1950s Cognitive approach
Made the study of the mind legitimate and scientific, experiments tested the computer metaphor (e.g. multi-store model).

1980s Biological approach
Observable behaviours studied, using controlled measures e.g. fMRI. Also genetic testing studies relationship between genes and behaviour.

Evaluation

Modern psychology
Learning, cognitive and biological approaches all use scientific methods e.g. lab research.

Subjective data
Humanistic and psychodynamic approaches rely on unscientific case studies. Research hampered by demand characteristics.

Evaluation extra: Paradigm
The question of whether psychology has agreed methods and assumptions is open to debate.

Learning approaches

The behaviourist approach

All behaviour is learned through association or consequences.

The approach

Assumptions
Observable behaviour is all that is needed to be studied.
Basic processes same in all species.

Classical conditioning – Pavlov
Research on salivation in dogs.
Association of UCS with NS to produce new CS and CR.

Operant conditioning – Skinner
Research with rats and pigeons in Skinner box.
Animal operates on the environment, behaviour shaped by consequences.
Reinforcement (positive and negative).
Punishment.

Evaluation

Well-controlled research
Behaviour broken down to stimulus–response units, helps remove extraneous variables.
Counterpoint – reducing behaviour in this way removes important influences on behaviour (e.g. thought).

Real-world application
Token economy systems used in prisons and psychiatric institutions.

Environmental determinism
All behaviour influenced by past experience, no room for free will.

Evaluation extra: Ethical issues
Controlled conditions important for research but not good for animals (e.g. kept hungry).

Social learning theory

All behaviour is learned from observing other people.

The approach

Assumptions
Behaviour is learned from experience.
In contrast with behaviourism, learned through observation and imitation of others (social).

Vicarious reinforcement
Observation leads to imitation if behaviour is vicariously reinforced (Bobo doll experiment).

Mediational processes
Attention, retention, motor reproduction, motivation.

Identification
More likely to imitate role models you identify with (e.g. attractive, high status).

Evaluation

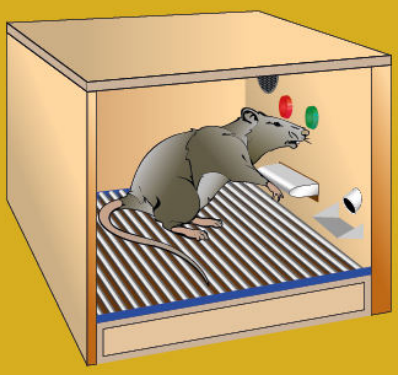
Cognitive factors
More comprehensive account of learning than proposed by the behaviourist approach.
Counterpoint – underestimates influence of biology, social learning involves mirror neurons in the brain.

Contrived lab studies
Demand characteristics (Bobo doll is designed to be hit), so low validity.

Real-world application
SLT can account for development of cultural differences e.g. in gender role.

Evaluation extra: Reciprocal determinism
Less determinist than behaviourism (reciprocal determinism).

The cognitive approach



The study of internal mental processes.

The approach

Assumptions
Internal mental processes can be studied through inference.

The role of schema
Beliefs and expectations affect thoughts and behaviour.
Innate (e.g. sucking schema) or learned.
Mental shortcut, leads to perceptual errors.

Theoretical and computer models
Information processing approach.
Mind is likened to a computer and applied to artificial intelligence.

The emergence of cognitive neuroscience
Scientific study of how brain structures affect mental processes.
Biological structures link to mental states e.g. Broca.
Brain imaging (e.g. fMRI) used to read the brain.

Evaluation

Scientific methods
Lab studies to produce reliable, objective data.
Cognitive neuroscience is scientific.
Counterpoint – use of inference and artificial stimuli lead to low external validity.

Real-world application
Successfully applied to the fields of artificial intelligence, depression and eyewitness testimony.

Machine reductionism
Computer analogy is too simple, it ignores the influence of emotion e.g. effect of anxiety on eyewitness testimony.

Evaluation extra: Soft determinism
Cognitive approach is an example of soft determinism, a middle-ground and more reasonable than behaviourism.

The biological approach

Everything psychological is at first biological.



The approach

Assumptions
The mind and body are one and the same.

The neurochemical basis of behaviour
Thought and behaviour depend on chemicals (neurotransmitters e.g. serotonin).

The genetic basis of behaviour
Concordance between MZ and DZ twins shows genetic basis of psychological characteristics.

Genotype and phenotype
Genes versus expression of genes in environment (nature and nurture).

Evolution and behaviour
Natural selection of genes based on survival value and, ultimately, reproductive success.

Evaluation

Real-world application
Understanding of biochemical processes is associated with the development of psychoactive drugs.
Counterpoint – antidepressants do not work for everyone (Cipriani *et al.*).

Scientific methods
Precise and objective methods e.g. scanning techniques such as fMRI and EEGs.

Biological determinism
Sees human behaviour as governed by internal genetically-determined factors, an oversimplification.

Evaluation extra: Natural selection
Popper claims theory of natural selection can't be falsified, but fossil record is supportive.



The psychodynamic approach

Behaviour is determined by unconscious forces that we cannot control.

The approach

The role of the unconscious
The conscious mind is the 'tip of the iceberg'.

The structure of personality
Id – primitive part, pleasure principle.
Ego – reality principle, protected by defence mechanisms.
Superego – formed age 5, sense of right and wrong, morality principle.

Psychosexual stages
Five stages, a different conflict at each stage leads to fixations.

Defence mechanisms
Used by the Ego to keep the Id 'in check' and reduce anxiety – repression, denial, displacement.

Evaluation

Real-world application
New form of therapy (psychoanalysis), forerunner to 'talking therapies'.
Counterpoint – not suitable for all mental disorders (e.g. not for schizophrenia).

Explanatory power
Influential theories about personality, moral development and gender identity.

Untestable concepts
Much of the theory is unfalsifiable, and based on case studies, thus pseudoscientific.

Evaluation extra: Psychic determinism
All behaviour is driven by the unconscious, leaves no room for free will.

Humanistic psychology

Emerged as the third force in psychology.

The approach

Free will
People are active agents who are self-determining.

Maslow's hierarchy of needs
5 levels – physiological, safety and security, love and belongingness, self-esteem, self-actualisation.

Self-actualisation
An innate tendency to want to reach your potential.

The self, congruence and conditions of worth
Personal growth requires congruence between self and ideal self.

Counselling psychology
Counsellor is genuine, empathic, unconditional positive regard (Rogers).

Evaluation

Not reductionist
Emphasis placed on the whole person (holism).
Counterpoint – concepts can't be observed or measured, so approach lacks empirical evidence.

Positive approach
Optimistic approach that sees people as basically good and in control.

Cultural bias
Associated with individualism.

Evaluation extra: Limited application
Critics claim little impact but revolutionised therapy (counselling), Maslow's hierarchy explains motivation.

Practice questions, answers and feedback

Question 1 Explain what Wundt meant by 'introspection'. (*2 marks*)	
Morticia's answer *This is a method that was used by Wundt to investigate the way people thought.*	Morticia's answer is too vague to be of any merit.
Luke's answer *It means to look inwards, specifically to look inside a person's head to understand what they are thinking and the way their mind works. It's a way to access conscious thinking.*	Luke's answer is somewhat better but there remains little reference to what Wundt did or how he did it.
Vladimir's answer *Wundt opened the first lab dedicated to the study of psychology. He wanted to investigate human behaviour and consciousness and used introspection to do this.*	Again, a disappointing answer. Vladimir's reference to the first psychology lab does not help define the term and how Wundt investigated consciousness is not explained properly.

Question 2 Using an example, explain the difference between 'genotype' and 'phenotype'. (*3 marks*)	
Morticia's answer *Genotypes are your genes which determine things like eye colour and many aspects of behaviour. Phenotype is what you actually see in terms of what people are like.*	The phenotype explanation is too vague to be of any value. The genotype definition is marginally better.
Luke's answer *You are born with a set of genes, called your genotype. However, these are expressed through the environment so the outcome is your phenotype which is your genes plus the environment. A good example is PKU, a genetic disorder which can cause later difficulties unless the baby's diet is adjusted (their environment). This adjustment of the environment leads to the baby's phenotype.*	This is an excellent answer from Luke. The definitions are supported by the example that clearly communicates the distinction between the two terms.
Vladimir's answer *Identical twins are a good example of phenotype because they have exactly the same genotype but not necessarily the same phenotype. Their phenotype is affected by their experiences (environment) which may be different.*	Vladimir almost communicates what is meant by 'phenotype' in the last sentence but more explanation is required. The only solid comment is the example of identical twins.

Question 3 Outline **one** assumption of humanistic psychology. (*3 marks*)	
Morticia's answer *One assumption of the humanistic approach is that people have free will. Free will means an individual can choose what they do, as opposed to determinism where people's behaviour is caused by outside forces. Other approaches like the behaviourist approach support determinism whereas the humanistic approach supports free will.*	Morticia's answer includes relevant description of the concept of free will, mostly made clear by the contrast with determinism. The point about the behaviourist approach does not really add anything to the answer.
Luke's answer *Humanistic psychology is quite different from the other approaches because it has the assumption that people have free will, and suggests that people can be self-determining. They are the agent of their own behaviour and can override external or internal causes if they wish to.*	Luke's answer is well-explained. He focuses entirely on the key concept and provides sufficient detail.
Vladimir's answer *Humanistic psychologists believe that people have free will and that it is important to have free will for healthy psychological development (self-actualisation). We are each responsible for our decisions. However this may apply more to individualist cultures than collectivist cultures where group needs are more important than personal growth and decision-making.*	Vladimir's answer provides a brief outline of free will but the link to healthy psychological development is not made explicit and doesn't really help the explanation of the assumption. Finally, the evaluation point at the end – though accurate – would be best reserved for another, more discursive question.

Question 4 A research report claimed that people who believe in aliens are 17 times more likely to claim that they have seen a UFO compared to people who do not. Explain what cognitive psychologists mean by 'schema'. Refer to the information above in your answer. (*4 marks*)	
Morticia's answer *Schema are packages of ideas that generate expectations. They are part of the way we think. Cognitive psychologists use them to explain thinking. People see UFOs because they believe in aliens and therefore are more likely to report them.*	Morticia gives a brief but accurate definition of schema supported by a similarly brief link to the stem, so neither component amounts to more than a partial answer.
Luke's answer *Schema are used by cognitive psychologists to describe how people think about the world and their experiences. This would explain UFOs because if you don't believe in them you wouldn't see them. This is an example of schema because it shows how people are thinking and it is affected by their schema.*	Luke's definition of schema offered here is not strong, though the link to the stem is partially successful.
Vladimir's answer *In the example the schema would be the belief that some people have that aliens do exist. Such schema are a mental framework for thinking about certain types of things such as UFOs as well as aliens. Having this belief leads to expectations and makes such people more likely to actually interpret something they see as a UFO. Schema may speed up information processing or may make our cognitive system prone to error (the UFO may not be there).*	Vladimir has done well. There is reference within this answer to 'mental framework', 'expectations' and to the idea that schema may speed up or distort processing, all of which show clear understanding of the concept. The application is also thorough and well embedded in the answer.

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

Question 5 Describe **and** evaluate the behaviourist approach in psychology. (*16 marks*)

Morticia's answer *Behaviourists take the view that the only thing that psychologists should concern themselves with is observable behaviour. Behaviourists are also focused on learning. They believe that all behaviour can be explained through learning – the experiences you have after you have been born.*

Learning may involve classical conditioning or operant conditioning. In the case of classical conditioning, first described by the Russian Pavlov, learning begins with a basic stimulus–response link. An unconditioned stimulus causes an unconditioned response. If a neutral stimulus becomes associated with the unconditioned stimulus it eventually predicts the unconditioned response, then it has become a conditioned stimulus producing a conditioned response. Pavlov demonstrated this with dogs and salivation. The dogs eventually salivated when they heard a bell because that became associated with the arrival of food.

Operant conditioning is about operating on your environment. An animal operates on its environment and this has consequences. If these consequences are rewarding then this reinforces the behaviour that brought about the reward and it will be repeated. A behaviour might lead an animal to avoid a negative experience and this is also reinforcing (negative reinforcement), so the behaviour is likely to be repeated. Punishment decreases the likelihood that behaviour will be repeated.

One limitation of behaviourist ideas is that they present a rather determinist view of behaviour. They leave out the idea that people can make decisions themselves which is called free will. This is better explained by the cognitive approach. Behaviourists suggest that everything we are can be explained by past conditioning experiences.

One strength of the approach is that it is very scientific with lots of very controlled studies of animals where there are few extraneous variables so the conclusions are firm. On the other hand there is the question of whether such very controlled artificial research with non-human animals really can be applied to human behaviour in the real world.

Another strength of the behaviourist approach is that it has been applied usefully. For example, token economy systems are used in prisons where rewards are used to shape prisoner behaviour.

(393 words)

Morticia's answer is well written and well balanced. The first paragraph is clear enough and followed by accurate, detailed accounts of the two forms of learning. Her descriptive content demonstrates knowledge, accuracy, clarity and organisation as well as use of specialist terminology.

There are relevant strengths and a limitation here too. Some of these – such as the point about being a determinist explanation – might have been supported by reference to alternative approaches. This is not a requirement of the question but is just plain good analysis. Morticia could have offered more commentary/analysis in relation to the use of lab studies.

Overall the answer is light on evaluation, which is especially important for A level. In order to produce good answers students must give special focus to evaluation and evaluation skills.

Vladimir's answer *The behaviourist approach is to explain all behaviour in terms of classical and operant conditioning, i.e. learning.*

The first demonstration of classical conditioning was by Pavlov. He was investigating salivation in dogs and noticed that they could be trained to salivate to the sound of a bell. He demonstrated this process in controlled lab conditions. If a bell was rung repeatedly at the same time as food was presented, the animal learned to associate the bell with food and eventually salivated to the bell alone.

Operant conditioning was demonstrated by Skinner with rats and pigeons in a cage called a Skinner box. If the animal pressed a lever a food pellet appeared. This reinforced the lever-press behaviour so that the animal repeated it more and more. Rats (and pigeons) could also be conditioned to avoid a stimulus such as an electric shock.

Both kinds of learning involve no thought. New connections are formed in the brain but behaviourists are not interested in what goes on in the brain – they just focused on how new behavioural links are formed, i.e. learned. They proposed that everything can be learned in this way.

Behaviourists suggest that humans are made of the same building blocks as animals and therefore the same laws apply. So all human behaviour too is learned and it is a passive process. Your behaviour is conditioned by things outside you. Of course this suggests that we have no free will yet most people do feel they have a sense of their own will. Skinner would argue that this is just an illusion of having made a decision.

On the positive side the behaviourist approach has been useful and good because it has led to some good ways to help people such as in prisons where people can be given rewards to encourage different behaviours. Real-world application is a positive for any approach.

(313 words)

Vladimir also describes the two forms of learning but with slightly less sophistication than in the answer above.

Besides this initial description there is further descriptive detail. He makes points related to the focus on observable behaviour and the link between human and animal learning though these are not always clearly expressed.

Evaluation/analysis is present but it is not the main focus of the essay. There is some analytic reference to free will (or lack of it), the qualitative difference between humans and animals, and a very brief comment on the limitations of animal studies at the end.

Overall, not as strong on evaluation as the previous answer and an overly descriptive answer. The evaluation content is partly effective but very limited, whereas the description is mostly clear and organised and specialist terminology has been used. The lack of evaluation has a serious impact on the overall worth of the answer. There should always be significantly more evaluation.

Multiple-choice questions

Origins of Psychology

1. From earliest to most recent, which of the following is the correct chronological order of when the following psychological approaches were first established?
   (a) Social learning theory, humanistic, behaviourist, cognitive neuroscience
   (b) Cognitive neuroscience, social learning theory, behaviourist, humanistic
   (c) Humanistic, behaviourist, cognitive neuroscience, social learning theory
   (d) Behaviourist, humanistic, social learning theory, cognitive neuroscience

2. Which of the following is a criticism that Watson made of introspection?
   (a) It can't be replicated.
   (b) It doesn't deal with experience.
   (c) It produces objective data.
   (d) It produces subjective data.

3. Which of the following approaches used a computer metaphor to study the mind?
   (a) The humanistic approach.
   (b) The behaviourist approach.
   (c) The cognitive approach.
   (d) The social learning theory approach.

4. The name of Wundt's pioneering method:
   (a) Introjection.
   (b) Interlocution.
   (c) Interpretation.
   (d) Introspection.

Learning approaches: The behaviourist approach

1. Which is a basic assumption of the behaviourist approach?
   (a) Learning processes in animals cannot be generalised to humans.
   (b) The main influence on behaviour is your genes.
   (c) Learning is influenced by private mental processes.
   (d) Learning should be studied scientifically in a laboratory.

2. Which correctly describes the key steps in classical conditioning?
   (a) UCR + NS = UCS and CS.
   (b) UCS + UCR = CS and CR.
   (c) NS + UCS = UCR + CR.
   (d) UCS + NS = CS and CR.

3. Complete this sentence: Operant conditioning is best described as:
   (a) A form of learning in which behaviour is shaped and maintained by its consequences.
   (b) A form of learning in which a stimulus is associated with a response.
   (c) A form of learning in which an observer imitates the behaviour of a role model.
   (d) A form of learning in which new behaviour is produced that avoids an unpleasant consequence.

4. A Behaviourist researcher carried out a lab experiment. He put a rat in a specially designed box. Every time a light came on, the rat would receive an electric shock to its feet. However, over time, the rat learned that if it pressed a lever when the light came on, it would not receive the shock. What aspect of operant conditioning is the Behaviourist researcher investigating?
   (a) Partial reinforcement.
   (b) Positive reinforcement.
   (c) Negative reinforcement.
   (d) Punishment.

Learning approaches: Social learning theory

1. Which one of the following statements about Bandura's Bobo doll experiments is false?
   (a) Children were more likely to imitate aggression that was rewarded (reinforced).
   (b) Children who saw the model punished were more likely to imitate aggression than children who saw no consequences.
   (c) The experiments have been used to support the idea that children may be influenced by what they see in the media.
   (d) The experiments support the idea that learning can often occur indirectly.

2. Which of the following is *not* a mediational process in the social learning approach?
   (a) Motivation.
   (b) Attention.
   (c) Retention.
   (d) Application.

3. Learning through observing the consequences of other people's behaviour is:
   (a) Positive reinforcement.
   (b) Negative reinforcement.
   (c) Operant reinforcement.
   (d) Vicarious reinforcement.

4. Which statement about the social learning theory approach is false?
   (a) Learning and performance always occur together.
   (b) Attention and retention are more likely to be involved in the learning than performance of behaviour.
   (c) Motor reproduction and motivation are more likely to be involved in the performance than learning of behaviour.
   (d) Role models that children identify with need not be real but may be symbolic.

The cognitive approach

1. Which statement about the role of schema is false?
   (a) They allow us to make mental shortcuts.
   (b) They may lead to perceptual errors.
   (c) They are not present at birth.
   (d) They act as a mental framework of interpretation.

2. A cognitive psychologist gave students simple word lists to learn under lab conditions. The students were able to recall an average of seven words within their short-term memory (STM). The psychologist concluded that the capacity of STM is seven items. This is a good example of:
   (a) Inference.
   (b) Interference.
   (c) Implication.
   (d) Illustration.

3. The cognitive approach is a good example of:
   (a) Motor reproduction.
   (b) Mundane realism.
   (c) Mirror reflection.
   (d) Machine reductionism.

4. Which statement about cognitive neuroscience is false?
   (a) It was first identified in the 1970s as an emergent discipline.
   (b) It investigates how biological structures influence mental processes.
   (c) It brings together the fields of cognitive psychology, anatomy and neurophysiology.
   (d) It makes use of advances in brain imaging technology such as fMRI.

The biological approach

1. Which of the following formulas is true?
   (a) Genotype + phenotype = environment.
   (b) Phenotype + environment = genotype.
   (c) Genotype + environment = phenotype.
   (d) Genotype – phenotype = environment.

2. Which is the best definition of natural selection?
   (a) The perpetuation of the best physical and psychological traits.
   (b) The selection of traits that promote successful survival and reproduction.
   (c) The survival of the fittest.
   (d) Choosing the best genes for future generations.

3. Dizygotic twins share approximately what percentage of their genes?
   (a) 100.
   (b) 50.
   (c) 25.
   (d) 0.

4. Which of the following is *not* an assumption of the biological approach?
   (a) The brain and the mind are distinct and separate.
   (b) Psychological characteristics may be genetically determined in the same way that physical characteristics are.
   (c) An imbalance in neurochemical levels may explain mental disorder.
   (d) Human behaviour has adapted to the environment through natural selection.

The psychodynamic approach

1. **Which of the following is *not* a term used by Freud in relation to the structure of the mind?**
   (a) Conscious.
   (b) Preconscious.
   (c) Subconscious.
   (d) Unconscious.

2. **In which stage does the Oedipus complex take place?**
   (a) Oral.
   (b) Anal.
   (c) Phallic
   (d) Genital.

3. **Which of the following is 'transferring feelings from the true source of distressing emotion onto a substitute object'?**
   (a) Displacement.
   (b) Denial.
   (c) Repression.
   (d) Regression.

4. **Freud's theory is most associated with?**
   (a) Environmental determinism.
   (b) Biological determinism.
   (c) Reciprocal determinism.
   (d) Psychic determinism.

Humanistic psychology

1. **When it first emerged, humanistic psychology came to be known as:**
   (a) The first force.
   (b) The second force.
   (c) The third force.
   (d) May the force be with you.

2. **When there is a mismatch between the self-concept and the ideal self, this is referred to as:**
   (a) Self-actualisation.
   (b) Conditions of worth.
   (c) Congruence.
   (d) Incongruence.

3. **According to Rogers, an effective therapist should provide the client with three things. Which of the following is not one of these?**
   (a) Being empathic.
   (b) Being judgemental.
   (c) Being genuine.
   (d) Unconditional positive regard.

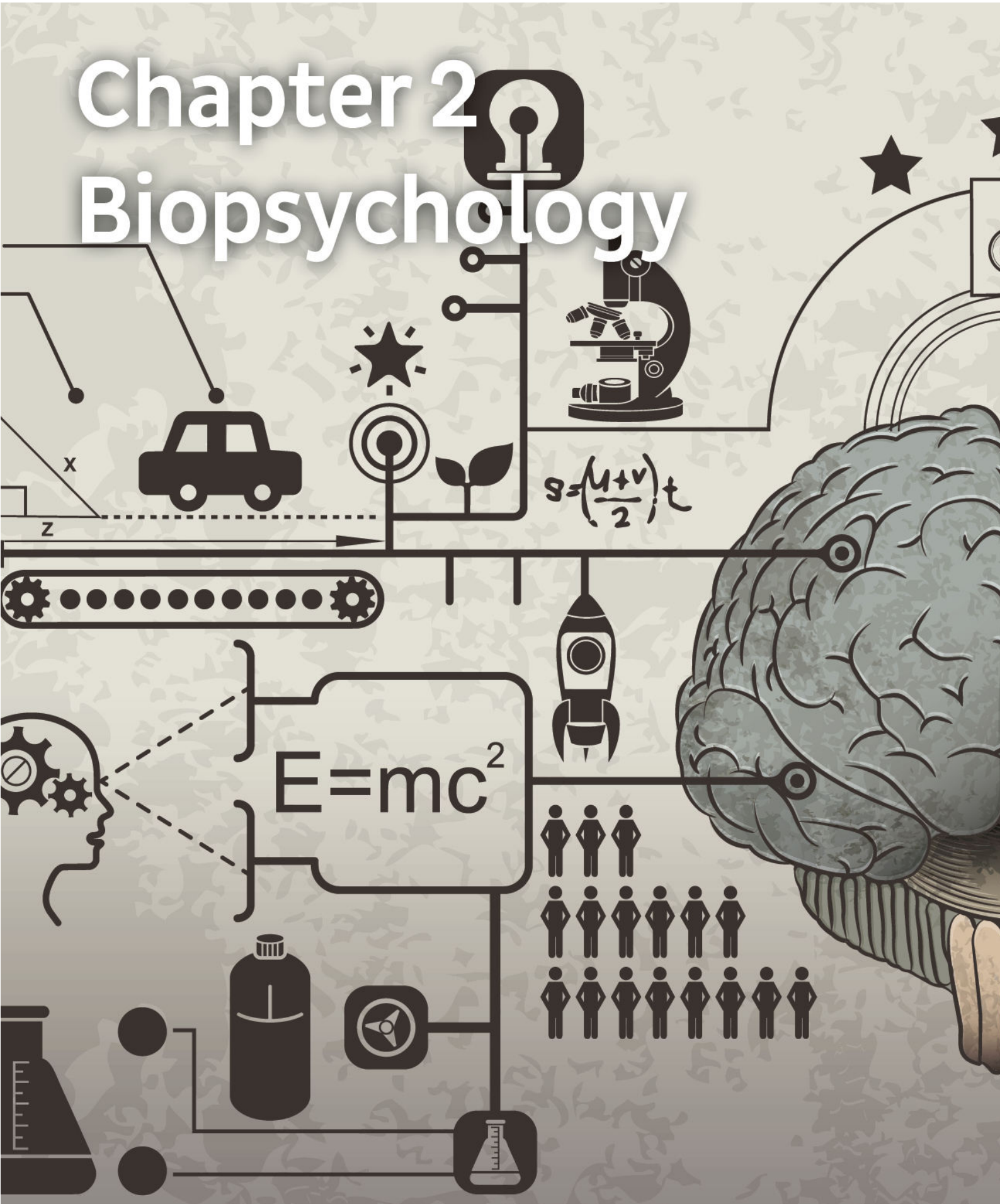
4. **Which of the following is a 'growth need' in Maslow's hierarchy?**
   (a) Self-actualisation.
   (b) Love and belongingness.
   (c) Safety and security.
   (d) Physiological.



MCQ answers

Origins of psychology 1D, 2D, 3C, 4D
Learning approaches: The behaviourist approach 1D, 2D, 3A, 4C
Learning approaches: Social learning theory 1B, 2D, 3D, 4A
The cognitive approach 1C, 2A, 3D, 4A
The biological approach 1C, 2B, 3B, 4A
The psychodynamic approach 1C, 2C, 3A, 4D
Humanistic psychology 1C, 2D, 3B, 4A

Chapter 2
Biopsychology

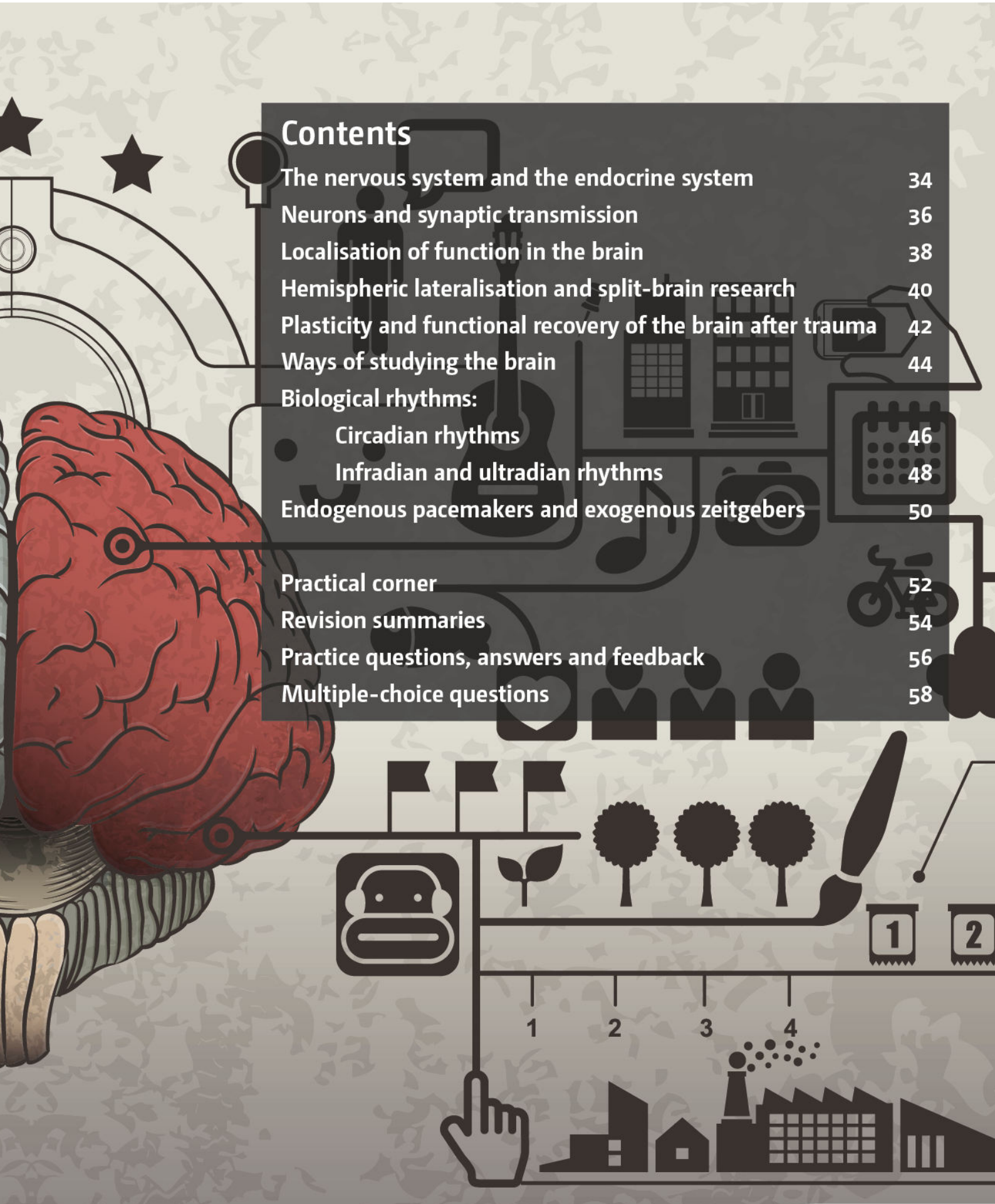


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The nervous system and the endocrine system

The specification says...

The divisions of the nervous system: central and peripheral (somatic and autonomic).

The function of the endocrine system: glands and hormones.

The fight or flight response including the role of adrenaline.

Humans, like all animals, have two major physiological systems that regulate behaviour in response to the environment. These are the nervous system and the endocrine system.

Key terms

Nervous system Consists of the central nervous system and the peripheral nervous system. Communicates using electrical signals.

Central nervous system (CNS) Consists of the brain and the spinal cord and is the origin of all complex commands and decisions.

Peripheral nervous system (PNS) Sends information to the CNS from the outside world, and transmits messages *from* the CNS to muscles and glands in the body.

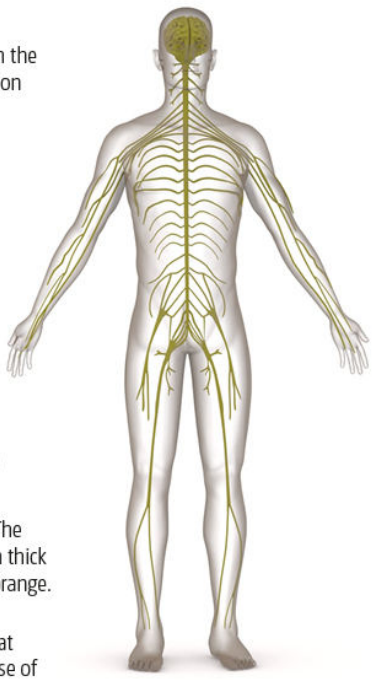
Somatic nervous system (SNS) Transmits information from receptor cells in the sense organs to the CNS. It also receives information from the CNS that directs muscles to act.

Autonomic nervous system (ANS) Transmits information to and from internal bodily organs. It is 'autonomic' as the system operates involuntarily (i.e. automatic). It has two main divisions: the *sympathetic* and *parasympathetic* nervous systems.

The nervous system acts more rapidly than the endocrine system but they are both very fast. The nervous system's average response time is 0.25 seconds but may be as quick as 100 milliseconds. The endocrine responses are slower because hormones have to travel through the bloodstream (about 2 or 3 seconds) but last longer.

The nervous system

The **nervous system** is a specialised network of cells in the human body and is our primary internal communication system. It is based on electrical and chemical signals whereas the endocrine system (facing page) is based on hormones.



The nervous system has two main functions:

- To collect, process and respond to information in the environment.
- To co-ordinate the working of different organs and cells in the body.

The nervous system is divided into two subsystems:

- **Central nervous system** (CNS).
- **Peripheral nervous system** (PNS).

The central nervous system (CNS)

The CNS is made up of the brain and the spinal cord.

- The **brain** is the centre of all conscious awareness. The brain's outer layer, the **cerebral cortex**, is only 3 mm thick and covers the brain like an orange peel covers an orange. It is only found in mammals.

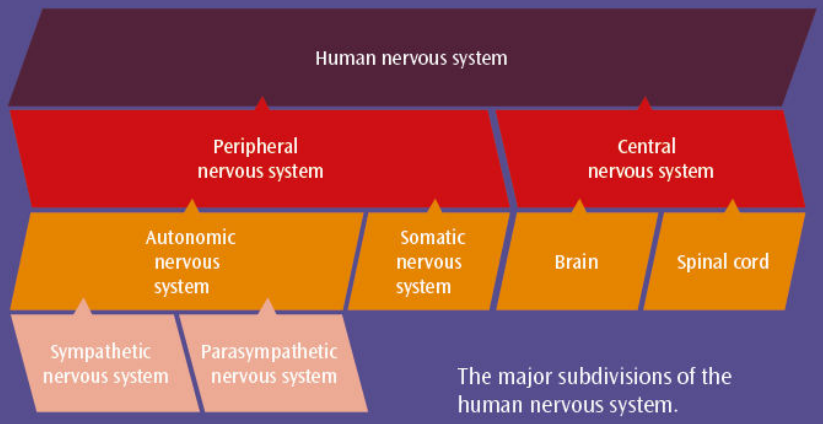
  The brain is highly developed in humans and is what distinguishes our higher mental functions from those of other animals. Only a few living creatures – sponges, sea squirts, jellyfish – do not have a brain.

  The brain is divided into two **hemispheres**.
- The **spinal cord** is an extension of the brain. It passes messages to and from the brain and connects nerves to the PNS. It is also responsible for reflex actions such as pulling your hand away from a hot plate.

The peripheral nervous system (PNS)

The PNS transmits messages, via millions of **neurons** (nerve cells), to and from the central nervous system. The peripheral nervous system is further subdivided into the:

- **Autonomic nervous system** (ANS) governs vital functions in the body such as breathing, heart rate, digestion, sexual arousal and stress responses.
- **Somatic nervous system** (SNS) governs muscle movement and receives information from sensory receptors.



The major subdivisions of the human nervous system.

Apply it Concepts

A frightening experience

Jim Bob was telling his friend Sue Ellen about his recent frightening experience.

'I was walking home by myself in the dark. Suddenly, I heard a shuffling noise behind me and the faint smell of rotting flesh. I realised it was coming closer. I saw a bus at the bus stop and decided to run. I could hear the footsteps getting closer. I don't think I've ever moved so quickly. I leapt on the bus – shaking, sweating and my heart was beating fast. I turned to see an empty street as the bus pulled away from the stop. Had I imagined it?'

Question

Outline the role of the central nervous system and autonomic nervous system in behaviour. Refer to Jim Bob's experience in your answer.

Practical activity on page 53

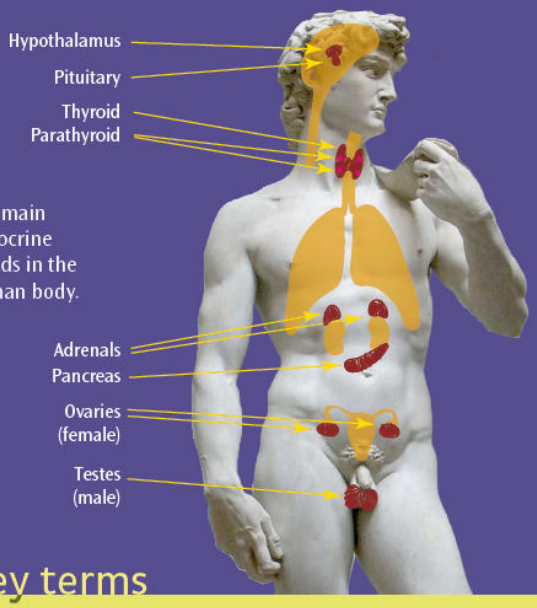
The endocrine system

Glands and hormones

The **endocrine system** works alongside the nervous system to control vital functions in the body. The endocrine system acts more slowly than the nervous system but has very widespread and powerful effects. Various **glands** in the body, such as the **thyroid gland**, produce **hormones**. Hormones are secreted into the bloodstream and affect any cell in the body that has a receptor for that particular hormone.

Most hormones affect cells in more than one body organ, leading to many diverse and powerful responses. For example, the thyroid gland produces the hormone **thyroxine**. This hormone affects cells in the heart (increases heart rate). It also affects cells throughout the body increasing metabolic rates (the chemical processes taking place in the cells). This in turn affects growth rates.

The main glands of the endocrine system are shown in the diagram on the right. The key endocrine gland is the **pituitary gland**, located in the brain. It is often called the 'master gland' because it controls the release of hormones from all the other endocrine glands in the body.



The main endocrine glands in the human body.

Endocrine and ANS working together: Fight or flight

Often the endocrine system and the autonomic nervous system (ANS) work in parallel with one another, for instance during a stressful event. When a stressor is perceived (your friend jumps out to frighten you or you think about your upcoming exams) the first thing that happens is a part of the brain called the **hypothalamus** activates the pituitary gland and this triggers activity in the sympathetic branch of the autonomic nervous system. The ANS changes from its normal resting state (the **parasympathetic state**) to the physiologically aroused **sympathetic state** (try it – think of a scary film and your sympathetic nervous system will kick in).

Adrenaline The stress hormone **adrenaline** is released from the *adrenal medulla* (a part of the adrenal gland lying near your kidneys) into the bloodstream. Adrenaline triggers physiological changes in the body (e.g. increased heart rate) which creates the physiological arousal necessary for the **fight or flight response**.

Immediate and automatic All of this happens in an instant as soon as the threat is detected (for example your heart starts beating faster almost as soon as you experience a fright). This is an acute response and an automatic reaction in the body. The physiological changes associated with this sympathetic response are listed in the table below right. These changes explain why stress, panic, or even excitement, are often experienced as a 'sick' feeling ('butterflies' in your stomach – does that describe what you were feeling?).

Parasympathetic action Finally, once the threat has passed, the parasympathetic nervous system returns the body to its resting state. The parasympathetic branch of the ANS works in opposition to the sympathetic nervous system – its actions are *antagonistic* to the sympathetic system. The parasympathetic system acts as a 'brake' and reduces the activities of the body that were increased by the actions of the sympathetic branch. This is sometimes referred to as the *rest and digest* response.

Key terms

Endocrine system One of the body's major information systems that instructs glands to release hormones directly into the bloodstream. These hormones are carried towards target organs in the body. Communicates via chemicals.

Gland An organ in the body that synthesises substances such as hormones.

Hormone A biochemical substance that circulates in the blood but only affects target organs. They are produced in large quantities but disappear quickly. Their effects are very powerful.

Fight or flight response The way an animal responds when stressed. The body becomes physiologically aroused in readiness to fight an aggressor or, in some cases, flee.

Adrenaline A hormone produced by the adrenal glands which is part of the human body's immediate stress response system. Adrenaline has a strong effect on the cells of the cardiovascular system – stimulating heart rate, contracting blood vessels and dilating air passages.

Biological changes associated with the sympathetic and parasympathetic response.

Sympathetic state	*Parasympathetic state*
Increases heart rate	Decreases heart rate
Increases breathing rate	Decreases breathing rate
Dilates pupils	Constricts pupils
Inhibits digestion	Stimulates digestion
Inhibits saliva production	Stimulates saliva production
Contracts rectum	Relaxes rectum

Apply it Methods

Stress and illness

Research has shown that people who get ill have often experienced major stressful life events in the previous few months and years, such as getting married, divorce, death of a loved one, etc. A researcher investigated this relationship between illness and life events. She gave 150 participants a questionnaire in which they had to indicate the number of major life events (from a list of 20) they had experienced over the past three years. This was compared with the number of days off work through illness the participants had had over the same period.

The researcher found a positive correlation between the two co-variables.

Questions

1. In the context of the investigation above, what is meant by 'a positive correlation between the two co-variables'? (*2 marks*)
2. Suggest a suitable graphical display that the researcher could have used to show the relationship between the two co-variables. (*1 mark*)
3. Explain *one* advantage of **correlational studies**. Refer to the investigation above in your answer. (*2 marks*)
4. Explain the difference between correlations and experiments. (*3 marks*)

Check it

1. Name **and** briefly outline **two** divisions of the human nervous system. *[4 marks]*
2. Identify **and** describe **two** glands of the endocrine system. *[2 marks + 2 marks]*
3. Identify **two** hormones **and** briefly outline their functions. *[2 marks + 2 marks]*
4. Explain what is meant by the 'fight or flight response'. *[3 marks]*

Neurons and synaptic transmission

The specification says...

The structure and function of sensory, relay and motor neurons.

The process of synaptic transmission including reference to neurotransmitters, excitation and inhibition.

On the previous spread we considered the major biological structures and systems. Now we will delve a little deeper and, in so doing, get a good deal smaller! We will investigate how the nervous system transmits signals via the billions of nerve cells (neurons) it houses.

We will also consider how these nerve cells communicate with each other, through electrical and chemical messages, within the body and the brain.

Key terms

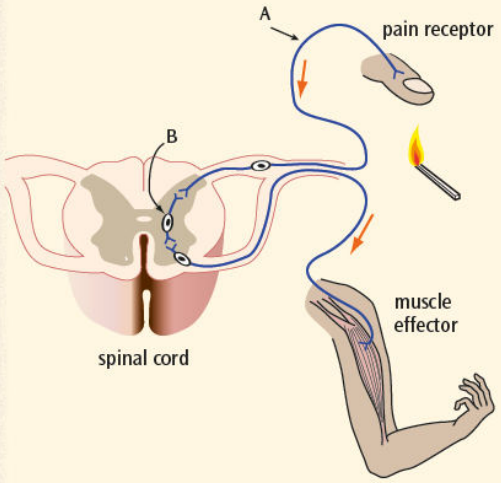
Neuron The basic building blocks of the nervous system, neurons are nerve cells that process and transmit messages through electrical and chemical signals.

Sensory neurons These carry messages from the PNS (peripheral nervous system) to the CNS (central nervous system). They have long dendrites and short axons.

Relay neurons These connect the sensory neurons to the motor or other relay neurons. They have short dendrites and short axons.

Motor neurons These connect the CNS to effectors such as muscles and glands. They have short dendrites and long axons.

Apply it Concepts — Function of neurons



Question

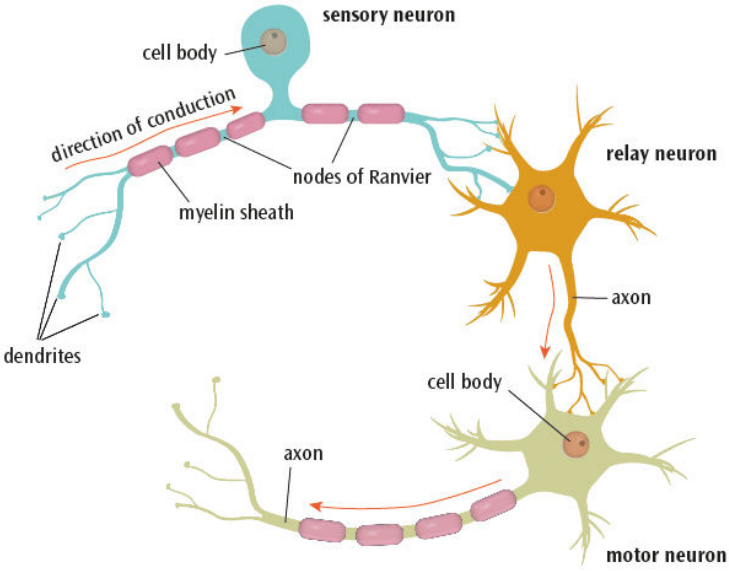
Identify the type of neuron labelled A and B.

The structure and function of neurons

There are 100 billion **neurons** (nerve cells) in the human nervous system, 80% of which are located in the brain. By transmitting signals *electrically* and *chemically*, these neurons provide the nervous system with its primary means of communication.

Types of neurons

There are three types of neurons: **sensory neurons**, **relay neurons** and **motor neurons**. The features of each are summarised in the key terms on the left and illustrated in the diagram below.



The structure of a neuron

Neurons vary in size from less than a millimetre to up to a metre long, but all share the same basic structure.

The **cell body** (or soma) includes a **nucleus**, which contains the **genetic** material of the cell. Branchlike structures called **dendrites** protrude from the cell body. These carry nerve impulses from neighbouring neurons towards the cell body.

The **axon** carries the impulses away from the cell body down the length of the neuron. The axon is covered in a fatty layer of **myelin sheath** that protects the axon and speeds up electrical transmission of the impulse.

If the myelin sheath was continuous this would have the reverse effect and slow down the electrical impulse. Thus, the myelin sheath is segmented by gaps called **nodes of Ranvier**. These speed up the transmission of the impulse by forcing it to 'jump' across the gaps along the axon.

Finally, at the end of the axon are **terminal buttons** that communicate with the next neuron in the chain across a gap known as the **synapse** (see facing page).

Location of neurons

The cell bodies of motor neurons may be in the **central nervous system** (CNS) but they have long axons which form part of the **peripheral nervous system** (PNS). Sensory neurons are located outside of the CNS, in the PNS in clusters known as **ganglia**. Relay neurons make up 97% of all neurons and most are found within the brain and the visual system.

Electrical transmission – the firing of a neuron

When a neuron is in a resting state the inside of the cell is negatively charged compared to the outside. When a neuron is activated by a stimulus, the inside of the cell becomes positively charged for a split second causing an **action potential** to occur. This creates an electrical impulse that travels down the axon towards the end of the neuron.

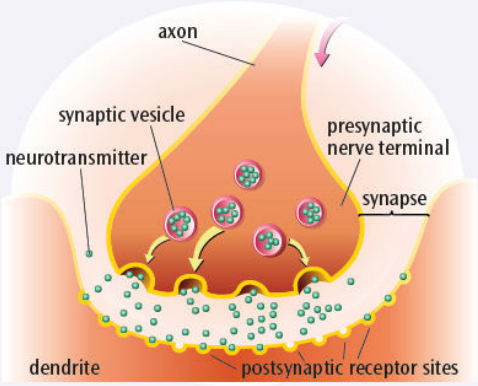
Practical activity on page 25

Synaptic transmission

Chemical transmission

Neurons communicate with each other within groups known as **neural networks**. Each neuron is separated from the next by an extremely tiny gap called the synapse. Signals *within* neurons are transmitted electrically. However, signals *between* neurons are transmitted chemically across the synapse.

When the electrical impulse reaches the end of the neuron (the **presynaptic terminal**) it triggers the release of neurotransmitter from tiny sacs called **synaptic vesicles**.



Neurotransmitters

Neurotransmitters are chemicals that diffuse across the synapse to the next neuron in the chain. Once a neurotransmitter crosses the gap, it is taken up by a **postsynaptic receptor site** on the dendrites of the next neuron (axons take signals to the synapse, dendrites take signals away). Here, the chemical message is converted back into an electrical impulse and the process of transmission begins again in this other neuron.

It is worth noting that the direction of travel can only be one-way. This is because neurotransmitters are released from the presynaptic neuron terminal and received by the postsynaptic neuron (at the receptor sites).

Several dozen types of neurotransmitter have been identified in the brain (as well as in the spinal cord and some **glands**). Each neurotransmitter has its own specific molecular structure that fits perfectly into a postsynaptic receptor site, similar to a lock and a key. Neurotransmitters also have specialist functions. For instance, **acetylcholine** (ACh) is found at each point where a motor neuron meets a muscle, and upon its release, it will cause muscles to contract.

Excitation and inhibition

Neurotransmitters have either an excitatory or inhibitory effect on the neighbouring neuron. For instance, the neurotransmitter **serotonin** causes inhibition in the receiving neuron, resulting in the neuron becoming more negatively charged and less likely to fire. In contrast, **adrenaline** (an element of the stress response which is both a **hormone** and a neurotransmitter) causes excitation of the postsynaptic neuron by increasing its positive charge and making it more likely to fire.

Summation

Whether a postsynaptic neuron fires is decided by the process of **summation**. The excitatory and inhibitory influences are summed: if the net effect on the postsynaptic neuron is inhibitory then the postsynaptic neuron is less likely to fire. If the net effect is excitatory it is more likely to fire, i.e. the inside of the postsynaptic neuron momentarily becomes positively charged. Once the electrical impulse is created it travels down the neuron.

Therefore, the action potential of the postsynaptic neuron is only triggered if the sum of the excitatory and inhibitory signals at any one time reaches the threshold.

Key terms

Synaptic transmission The process by which neighbouring neurons communicate with each other by sending chemical messages across the gap (the synapse) that separates them.

Neurotransmitter Brain chemicals released from synaptic vesicles that relay signals across the synapse from one neuron to another. Neurotransmitters can be broadly divided into those that perform an excitatory function and those that perform an inhibitory function.

Excitation When a neurotransmitter, such as adrenaline, increases the positive charge of the postsynaptic neuron. This *increases* the likelihood that the postsynaptic neuron will pass on the electrical impulse.

Inhibition When a neurotransmitter, such as serotonin, increases the negative charge of the postsynaptic neuron. This *decreases* the likelihood that the postsynaptic neuron will pass on the electrical impulse.

Apply it Concepts — Psychoactive drugs

Increased understanding of the mode of action of neurotransmitters in the brain has led to the development of psychoactive drugs to treat mental disorders. For instance, depression has been linked to low levels of serotonin, which is thought to play an important role in stabilising mood.

A category of drugs known as SSRIs (selective serotonin reuptake inhibitors) such as Prozac, slow down the reuptake of serotonin after it has crossed the synapse, ensuring it stays active for longer in the synapse.

Question

Use your knowledge of synaptic transmission to explain what is happening at the synapse.

Apply it Concepts — The reflex arc

Fill in the gaps using the terms provided at the bottom of the box.

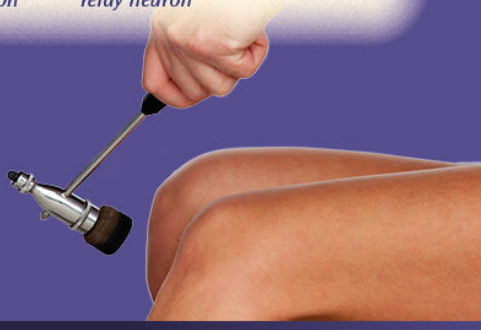
The knee-jerk reflex is an example of a reflex arc:

A stimulus, such as a hammer, hits the knee. This is detected by sense organs in the _____, which convey a message along a _____.

The message reaches the _____, where it connects with a _____. This then transfers the message to a _____. This then carries the message to an _____, such as a muscle, which causes the muscle to contract and, hence, causes the knee to move or jerk.

Missing words:

effector	*CNS (central nervous system)*
sensory neuron	*PNS (peripheral nervous system)*
motor neuron	*relay neuron*



Check it

1. Explain the process of synaptic transmission. *[4 marks]*
2. With reference to neurotransmitters, explain what is meant by both 'excitation' **and** 'inhibition'. *[4 marks]*
3. Outline **one** difference between a sensory neuron and a relay neuron. *[2 marks]*

Localisation of function in the brain

The specification says...

Localisation of function in the brain: motor, somatosensory, visual, auditory and language centres; Broca's and Wernicke's areas.

The human brain is one of the most complex and fascinating of all biological systems. On this spread, we discuss the idea that different functions of the brain are *localised* in specific areas. We will also take a whistle-stop tour through some of the key parts of the brain.

Key terms

Localisation of function The theory that different areas of the brain are responsible for specific behaviours, processes or activities.

Motor area A region of the frontal lobe involved in regulating movement.

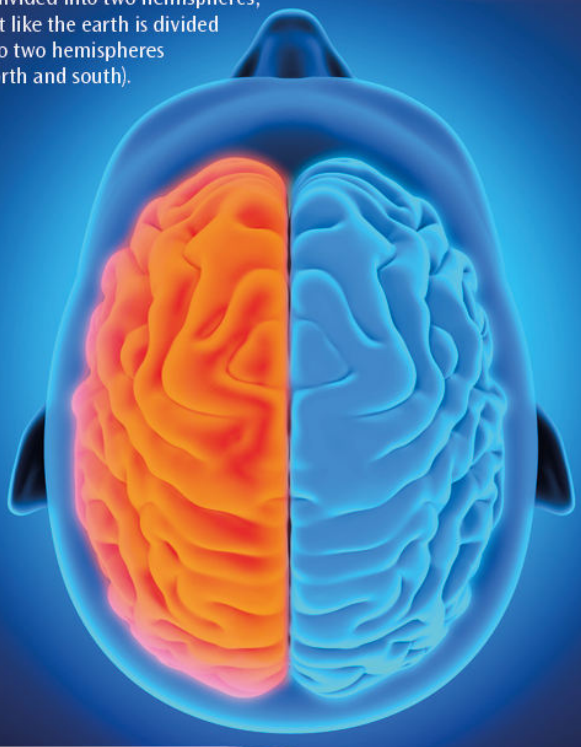
Somatosensory area An area of the parietal lobe that processes sensory information such as touch.

Visual area A part of the occipital lobe that receives and processes visual information.

Auditory area Located in the temporal lobe and concerned with the analysis of speech-based information.

Broca's area An area of the frontal lobe in the left hemisphere (in most people), responsible for speech production.

Wernicke's area An area of the temporal lobe (encircling the auditory cortex) in the left hemisphere (in most people), responsible for language comprehension.



The main part of the brain (the cerebrum) is divided into two hemispheres, just like the earth is divided into two hemispheres (north and south).

Localisation of function

Localisation versus holistic theory

During the 19th century, scientists such as Paul Broca and Karl Wernicke discovered that specific areas of the brain are associated with particular physical and psychological functions. Before these investigations (and before the case of Phineas Gage – see facing page), scientists generally supported the **holistic** theory of the brain – that *all* parts of the brain were involved in the processing of thought and action.

In contrast, Broca and Wernicke argued for **localisation of function** (sometimes referred to as *cortical specialisation*). This is the idea that different parts of the brain perform different tasks and are involved with different parts of the body. It follows then, that if a certain area of the brain becomes damaged through illness or injury, the function associated with that area will also be affected.

Hemispheres of the brain

The main part of the brain (the *cerebrum*) is divided into two symmetrical halves called the left and right hemisphere. Some of our physical and psychological functions are controlled or dominated by a particular hemisphere – this is called **lateralisation** (see next spread). As a general rule, activity on the left-hand side of the body is controlled by the right hemisphere and activity on the right-hand side of the body by the left hemisphere. Language, as we will see below, is linked to the left hemisphere.

The motor, somatosensory, visual and auditory centres

The cerebral cortex (or 'cortex') is the outer layer of both hemispheres – as described on page 34. The cortex of both hemispheres is subdivided into four centres – called the 'lobes' of the brain: the frontal lobe, the parietal lobe, the occipital lobe and the temporal lobe (see diagram on facing page). A 'lobe' is a part of an organ that is separate in some way from the rest. Each lobe in the brain is associated with different functions.

At the back of the frontal lobe (in both hemispheres) is the **motor area** which controls voluntary movement in the opposite side of the body. Damage to this area of the brain may result in a loss of control over fine movements.

At the front of both parietal lobes is the **somatosensory area** which is separated from the motor area by a 'valley' called the *central sulcus*. The somatosensory area is where sensory information from the skin (e.g. related to touch, heat, pressure, etc.) is represented. The amount of somatosensory area devoted to a particular body part denotes its sensitivity, for instance, receptors for our face and hands occupy over half of the somatosensory area.

In the occipital lobe at the back of the brain is the **visual area** (or visual cortex). Each eye sends information from the right visual field to the left visual cortex and from the left visual field to the right visual cortex. This means that damage to the left hemisphere, for example, can produce blindness in part of the right visual field of both eyes.

Finally, the temporal lobes house the **auditory area**, which analyses speech-based information. Damage may produce partial hearing loss. The more extensive the damage, the more extensive the loss. In addition, damage to a specific area of the temporal lobe – Wernicke's area (discussed below) – may affect the ability to comprehend language.

The language centres of the brain

Unlike the areas above which are found in both hemispheres, language is restricted to the left side of the brain in most people. In the 1880s, Paul Broca, a surgeon, identified a small area in the left frontal lobe responsible for speech production. Damage to **Broca's area** causes Broca's aphasia which is characterised by speech that is slow, laborious and lacking in fluency. Broca's most famous patient was 'Tan' – so-called because that was the only word he could say. People with Broca's aphasia have difficulty with prepositions and conjunctions (e.g. a, the, and).

Around the same time as Broca, Karl Wernicke was describing people who had no problem producing language but severe difficulties understanding it, such that the speech they produced was fluent but meaningless. Wernicke identified a region (**Wernicke's area**) in the left temporal lobe as being responsible for language understanding. This results in *Wernicke's aphasia* when damaged. People who have Wernicke's aphasia will often produce nonsense words (*neologisms*) as part of the content of their speech.

Evaluation

Evidence from neurosurgery

One strength of localisation theory is that damage to areas of the brain has been linked to mental disorders.

Neurosurgery (surgery on the brain) is a last resort method for treating some mental disorders, targeting specific areas of the brain which may be involved. For example, *cingulotomy* involves isolating a region called the *cingulate gyrus* which has been implicated in **OCD**. Darin Dougherty *et al.* (2002) reported on 44 people with OCD who had undergone a cingulotomy. At post-surgical follow-up after 32 weeks, about 30% had met the criteria for successful response to the surgery and 14% for partial response.

The success of these procedures suggests that behaviours associated with serious mental disorders may be localised.

Evidence from brain scans

Another strength is evidence from **brain scans** that supports the idea that many everyday brain functions are localised.

For instance, Steven Petersen *et al.* (1988) used brain scans to demonstrate how Wernicke's area was active during a listening task and Broca's area was active during a reading task. Also, a review of **long-term memory** studies by Buckner and Petersen (1996) revealed that **semantic** and **episodic memories** reside in different parts of the **prefrontal cortex**. These studies confirm localised areas for everyday behaviours.

Therefore objective methods for measuring brain activity have provided sound scientific evidence that many brain functions are localised.

Counterpoint A challenge to localisation theory comes from the work of Karl Lashley (1950). Lashley removed areas of the cortex (between 10% and 50%) in rats that were learning the route through a maze. No area was proven to be more important than any other area in terms of the rats' ability to learn the route. The process of learning seemed to require every part of the cortex rather than being confined to a particular area.

This suggests that higher cognitive processes, such as learning, are not localised but distributed in a more **holistic** way in the brain.

Language localisation questioned

One limitation is that language may not be localised just to Broca's and Wernicke's areas.

A recent review by Anthony Dick and Pascale Tremblay (2016) found that only 2% of modern researchers think that language in the brain is completely controlled by Broca's and Wernicke's areas. Advances in brain imaging techniques, such as **fMRI**, mean that neural processes in the brain can be studied with more clarity than ever before. It seems that language function is distributed far more holistically in the brain than was first thought. So-called language streams have been identified across the cortex, including brain regions in the right hemisphere, as well as **subcortical** regions such as the **thalamus**.

This suggests that, rather than being confined to a couple of key areas, language may be organised more holistically in the brain, which contradicts localisation theory.

Evaluation eXtra

Case study evidence

Unique cases of neurological damage support localisation theory, such as the case of Phineas Gage (see top right).

However, there are problems with case studies. It is difficult to make meaningful generalisations from the findings of a single individual. Also, conclusions drawn may depend on the subjective interpretation of the researcher.

Consider: *How might this affect the validity of this evidence supporting localisation theory?*

Apply it
Concepts

The curious case of Phineas Gage



Whilst working on the railroad in 1848, 25-year-old Phineas Gage was preparing to blast a section of rock with explosives to create a new railway line. During the process, Gage dropped his tamping iron onto the rock causing the explosive to ignite. The explosion hurled the metre-length pole through Gage's left cheek, passing behind his left eye, and exiting his skull from the top of his head taking a portion of his brain with it – most of his left frontal lobe.

Incredibly, Gage survived but the damage to his brain had left a mark on his personality – by all accounts he had turned from someone who was calm and reserved to someone who was quick-tempered, rude and 'no longer Gage'.

Gage is seen as a landmark case in science as the change in his temperament following the accident suggested that the frontal lobe may be responsible for regulating mood.

Question

Does the case of Phineas Gage support localisation theory or holistic theory? Why?

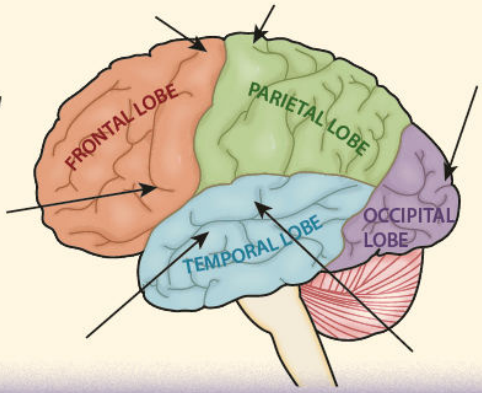
Apply it
Concepts

Label the brain

Use the information on the facing page to help you label the areas of the brain.

Labels:

Somatosensory area
Wernicke's area
Visual area
Auditory area
Motor area
Broca's area



Check it

1. Using an example, explain what is meant by 'localisation of function'. *[3 marks]*
2. State the location in the brain of each of the following:
   (i) The motor area
   (ii) The visual area
   (iii) The auditory area. *[3 marks]*
3. Explain how Broca's and Wernicke's areas contribute to the localisation of language in the brain. *[4 marks]*
4. Discuss what research has shown about localisation of function in the brain. *[16 marks]*

Hemispheric lateralisation and split-brain research

The specification says...

Hemispheric lateralisation; split-brain research.

Neuroscientists are interested in whether certain activities and behaviours are controlled or dominated by one hemisphere rather than the other (known as lateralisation – as distinct from localisation).

Key terms

Hemispheric lateralisation The idea that the two halves (hemispheres) of the brain are *functionally different* and that certain mental processes and behaviours are mainly controlled by one hemisphere rather than the other, as in the example of language (which is localised as well as lateralised).

Split-brain research A series of studies which began in the 1960s (and are still ongoing) involving people with epilepsy who had experienced a surgical separation of the hemispheres of their brain to reduce the severity of their epilepsy. This enabled researchers to test lateral functions of the brain in isolation.



If two words are presented simultaneously, one on either side of the visual field (e.g. 'KEY' on the left and 'RING' on the right), a split-brain individual would select a key with their left hand (left visual field linked to right hemisphere and linked to left hand) and say the word 'ring'.

Apply it Methods

Lateralisation and handedness

A study of 400 right-handed people revealed that 380 of them had LH dominance for language.

Questions

1. What percentage of right-handed people in the study above were LH dominant for language? (*1 mark*)
2. Express your answer to question 1 as a fraction. (*1 mark*)

In a further study 400 left-handed people were tested. In 80 cases language was in the RH, and for a further 80, language functions were arranged *bilaterally*, i.e. across both hemispheres.

3. What percentage of the language functions of left-handed people were bilateral? (*1 mark*)
4. How might Sperry's findings have been different if some participants were left-handed? (*3 marks*)

Hemispheric lateralisation

Localisation and lateralisation

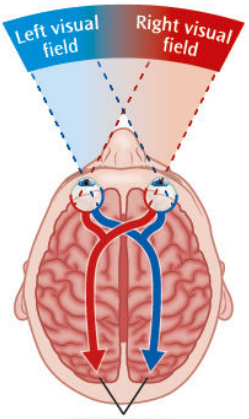
On the previous spread you learned about **localisation** of brain areas. This refers to the fact that some functions, such as vision and language, are governed by very specific areas in the brain. You also learned that the brain is **lateralised** i.e. there are two sides which are called **hemispheres** (thus hemispheric lateralisation). For some functions the localised areas appear in both hemispheres. For example in the case of vision, the visual area is in the left and right occipital lobe – located in the left hemisphere (LH) and right hemisphere (RH) respectively.

Left and right hemispheres

In the case of language, the two main centres are only in the LH (for most people) – Broca's area is in the left frontal lobe and Wernicke's area is in the left temporal lobe. So we say that language is *lateralised* – that is, performed by one hemisphere rather than the other. The RH can only produce rudimentary words and phrases but contributes emotional context to what is being said. This has led to the suggestion that the LH is the *analyser* whilst the RH is the *synthesiser*.

Many functions are not lateralised. For example vision, motor and somatosensory areas appear in both hemispheres. But there is a further twist, in the case of the motor area the brain is *cross-wired* (*contralateral* wiring) – the RH controls movement on the left side of the body whilst the LH controls movement on the right.

In the case of vision the situation is even more complex – it is both contralateral and *ipsilateral* (opposite and same-sided). Each eye receives light from the left visual field (LVF) and the right visual field (RVH). The LVF of both eyes is connected to the RH and the RVF of both eyes is connected to the LH (see diagram on right). This enables the visual areas to compare the slightly different perspective from each eye and aids depth perception. There is a similar arrangement for auditory input to the auditory area and the disparity from the two inputs helps us locate the source of sounds.



Split-brain research

A 'split-brain' operation involves severing the connections between the RH and LH, mainly the *corpus callosum*. This is a surgical procedure used to reduce epilepsy. During an epileptic seizure the brain experiences excessive electrical activity which travels from one hemisphere to the other. To reduce fits these connections are cut, 'splitting' the brain in two halves. Split-brain research studies how the hemispheres function when they can't communicate with each other.

Sperry's research

Roger Sperry (1968) devised a system to study how two separated hemispheres deal with, for example, speech and vision.

Procedure Eleven people who had a split-brain operation were studied using a special set up (see left) in which an image could be projected to a participant's RVF (processed by the LH) and the same, or different, image could be projected to the LVF (processed by the RH). In the 'normal' brain, the corpus callosum would immediately share the information between both hemispheres giving a complete picture of the visual world. However, presenting the image to one hemisphere of a split-brain participant meant that the information cannot be conveyed from that hemisphere to the other.

Findings When a picture of an object was shown to a participant's RVF (linked to LH), the participant could describe what was seen. But they could not do this if the object was shown to the LVF (RH) – they said there was 'nothing there'. This is because, in the connected brain, messages from the RH are relayed to the language centres in the LH, but this is not possible in the split-brain.

Although participants could not give verbal labels to objects projected to the LVF, they could select a matching object out of sight (see picture) using their left hand (linked to RH). The left hand was also able to select an object that was most closely associated with an object presented to the LVF (for instance, an ashtray was selected in response to a picture of a cigarette).

If a pinup picture was shown to the LVF there was an emotional reaction (e.g. a giggle) but the participants usually reported seeing nothing or just a flash of light.

Conclusions These observations show how certain functions are lateralised in the brain and support the view that the LH is verbal and the RH is 'silent' but emotional.

Evaluation

Lateralisation in the connected brain

One strength is research showing that even in connected brains the two hemispheres process information differently.

For example, Gereon Fink *et al.* (1996) used **PET scans** to identify which brain areas were active during a visual processing task. When participants with connected brains were asked to attend to global elements of an image (such as looking at a picture of a whole forest) regions of the RH were much more active. When required to focus in on the finer detail (such as individual trees) the specific areas of the LH tended to dominate.

This suggests that, at least as far as visual processing is concerned, hemispheric lateralisation is a feature of the connected brain as well as the split-brain.

One brain

One limitation is the idea that the LH as analyser and RH as synthesiser may be wrong.

There may be different functions in the RH and LH, but research suggests people do not have a dominant side of their brain which creates a different personality. Jared Nielsen *et al.* (2013) analysed brain scans from over 1000 people aged 7 to 29 years and did find that people used certain hemispheres for certain tasks (evidence for lateralisation). But there was no evidence of a dominant side, i.e. not artist's brain or mathematician's brain.

This suggests that the notion of right- or left-brained people is wrong.

Evaluation eXtra

Lateralisation versus plasticity

Lateralisation is adaptive as it enables two tasks to be performed simultaneously with greater efficiency. Lesley Rogers *et al.* (2004) showed that lateralised chickens could find food while watching for predators but 'normal' chickens couldn't.

On the other hand, neural **plasticity** could also be seen as adaptive. Following damage through illness or trauma, some functions can be taken over by non-specialised areas in the opposite hemisphere. For instance, language function can literally 'switch sides' (Holland *et al.* 1996).

Consider: *Which is more adaptive, plasticity or dedicated function?*

Evaluation

Research support

One strength is support from more recent split-brain research.

Michael Gazzaniga (Luck *et al.* 1989) showed that split-brain participants actually perform *better* than connected controls on certain tasks. For example, they were faster at identifying the odd one out in an array of similar objects than normal controls. In the normal brain, the LH's better cognitive strategies are 'watered down' by the inferior RH (Kingstone *et al.* 1995).

This supports Sperry's earlier findings that the 'left brain' and 'right brain' are distinct.

Generalisation issues

One limitation of Sperry's research is that causal relationships are hard to establish.

The behaviour of Sperry's split-brain participants was compared to a **neurotypical control group**. An issue though is that none of the participants in the control group had epilepsy. This is a major **confounding variable**. Any differences that were observed between the two groups may be the result of the epilepsy rather than the split brain.

This means that some of the unique features of the split-brain participants' cognitive abilities might have been due to their epilepsy (though Fink's research, above, supports Sperry's conclusions).

Evaluation eXtra

Ethics

The split-brain operation was not performed for the purpose of the research. So, in that sense, Sperry's participants were not deliberately harmed. In addition, all procedures were explained to the split-brain participants and their full informed consent was obtained.

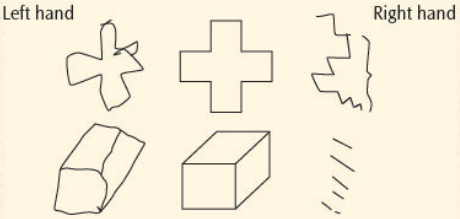
However the trauma of the operation might mean that the participants did not later fully understand the implications of what they had agreed to. They were subject to repeated testing over a lengthy period (years in some cases), and this may have been stressful over time.

Consider: *Were Sperry's experiments ethical?*

Apply it
Concepts

The drawing abilities of the left and right hemispheres

What the RH lacks in linguistic skill, it partly makes up for in terms of superior drawing abilities. This has been shown in tests with split-brain individuals. A picture is flashed to either their RVF or LVF. As you can see in the drawings below, the left hand continually outperformed the right hand in such tests despite the fact that, for all the participants, the right hand was their preferred hand.



Question

Using your knowledge of split-brain studies, explain why this shows that the RH is dominant for drawing skill.

Apply it
Concepts

Kim Peek – a natural split-brain

Kim Peek was born with a total absence of a corpus callosum. This meant that unlike Sperry's participants, Peek's split-brain was due to natural causes.

Peek's powers of memory were prodigious. He had word-for-word recall of over 12,000 books. He could read two pages in around ten seconds, employing his split-brain to simultaneously read one page with his RVF and one page with his LVF. He knew phone books by heart, and could say what day of the week a particular date fell on going back decades.

Question

It is likely that Peek had fully-developed (*bilateral*) language centres in both hemispheres of his brain which may explain some of his extraordinary abilities. How does this make him different from Sperry's participants?

Check it

1. Outline **one** procedure used in split-brain research. *[3 marks]*
2. Briefly evaluate split-brain research on hemispheric lateralisation. *[4 marks]*
3. Discuss research on hemispheric lateralisation. *[16 marks]*

Plasticity and functional recovery of the brain after trauma

The specification says...

Plasticity and functional recovery of the brain after trauma.

Neural plasticity is the apparent ability of the brain to change and adapt its structures and processes as a result of experience and new learning. This links directly to the idea of functional recovery – the way that certain abilities of the brain may be moved or redistributed rather than lost following damage or trauma to the brain.

Key terms

Plasticity This describes the brain's tendency to change and adapt as a result of experience and new learning. This generally involves the growth of new connections.

Functional recovery A form of plasticity. Following damage through trauma, the brain's ability to redistribute or transfer functions usually performed by a damaged area(s) to other, undamaged area(s).



'You wouldn't believe the size of my posterior hippocampus, mate.' A London cabbie talks brain plasticity.

Apply it
Methods

Brainy cab drivers

A researcher compared the hippocampal volume of taxi drivers (who drive different routes every day) with bus drivers (who follow the same routes every day). The researcher used an unrelated *t*-test to analyse the data and a significant difference was found at the 0.05 level.

Questions

1. Explain *two* reasons why the **unrelated *t*-test** was an appropriate choice for this research. *(4 marks)*
2. With reference to this research, explain what is meant by the phrase 'a **significant** difference was found at the 0.05 level'. *(2 marks)*

Plasticity

Brain plasticity

The brain would appear to be 'plastic' (not literally – it's a metaphor!) in the sense that it has the ability to change throughout life. During infancy, the brain experiences a rapid growth in the number of **synaptic** connections it has, peaking at about 15,000 per neuron at 2–3 years of age (Gopnik *et al.* 1999). This is about twice as many as there are in the adult brain. As we age, rarely-used connections are deleted and frequently-used connections are strengthened – a process known as *synaptic pruning*. People once thought that the adult brain was not capable of change but we now understand that synaptic pruning enables lifelong **plasticity** where new neural connections are formed in response to new demands on the brain.

Research into plasticity

Eleanor Maguire *et al.* (2000) studied the brains of London taxi drivers and found significantly more volume of grey matter in the posterior **hippocampus** than in a matched **control group**. This part of the brain is associated with the development of spatial and navigational skills in humans and other animals. As part of their training, London cabbies must take a complex test called 'The Knowledge', which assesses their recall of the city streets and possible routes. Maguire *et al.* found that this learning experience alters the structure of the taxi drivers' brains. They also found that the longer the taxi drivers had been in the job, the more pronounced was the structural difference (a **positive correlation**).

A similar finding was observed by Bogdan Draganski *et al.* (2006) who imaged the brains of medical students three months before and after their final exams. Learning-induced changes were seen to have occurred in the posterior hippocampus and the **parietal cortex** presumably as a result of the learning.

Functional recovery

After brain trauma

Following physical injury, or other forms of trauma such as the experience of a stroke, unaffected areas of the brain are often able to adapt and compensate for those areas that are damaged. The **functional recovery** that may occur in the brain after trauma is an example of neural plasticity. Healthy brain areas may take over the functions of those areas that are damaged, destroyed or even missing. Neuroscientists suggest that this process can occur quickly after trauma (spontaneous recovery) and then slow down after several weeks or months. At this point the individual may require rehabilitative therapy to further their recovery (see facing page).

What happens in the brain during recovery?

The brain is able to rewire and reorganise itself by forming new synaptic connections close to the area of damage (a bit like avoiding roadworks on the way to school by finding a different route). Secondary neural pathways that would not typically be used to carry out certain functions are activated or 'unmasked' to enable functioning to continue, often in the same way as before (Doidge 2007). This process is supported by a number of structural changes in the brain including:

- *Axonal sprouting* – the growth of new nerve endings which connect with other undamaged nerve cells to form new neuronal pathways.
- *Denervation supersensitivity* – this occurs when axons that do a similar job become aroused to a higher level to compensate for the ones that are lost. However, it can have the negative consequence of oversensitivity to messages such as pain.
- *Recruitment of homologous* (similar) *areas* on the opposite side of the brain. This means that specific tasks can still be performed. An example would be if Broca's area was damaged on the left side of the brain, the right-sided equivalent would carry out its functions. After a period of time, functionality may then shift back to the left side.

Study tip

Functional recovery after trauma is one dramatic example of how the brain is plastic and has the ability to adapt to changing circumstances. For this reason, if you are discussing brain plasticity, it would be acceptable to use material on 'functional recovery after trauma' within the answer.

Evaluation

Negative plasticity

One limitation of plasticity is that it may have negative behavioural consequences.

Evidence has shown that the brain's adaptation to prolonged drug use leads to poorer cognitive functioning in later life, as well as an increased risk of dementia (Medina *et al*. 2007). Also, 60–80% of amputees have been known to develop phantom limb syndrome – the continued experience of sensations in the missing limb as if it were still there. These sensations are usually unpleasant, painful and are thought to be due to cortical reorganisation in the **somatosensory cortex** that occurs as a result of limb loss (Ramachandran and Hirstein 1998).

This suggests that the brain's ability to adapt to damage is not always beneficial.

Age and plasticity

One strength is that brain plasticity may be a life-long ability.

In general plasticity reduces with age. However, Ladina Bezzola *et al*. (2012) demonstrated how 40 hours of golf training produced changes in the neural representations of movement in participants aged 40–60. Using **fMRI**, the researchers observed increased **motor cortex** activity in the novice golfers compared to a **control group**, suggesting more efficient neural representations after training.

This shows that neural plasticity can continue throughout the lifespan.

Evaluation eXtra

Seasonal brain changes

Research suggests that there may be seasonal plasticity in the brain in response to environmental changes. For example, consider the suprachiasmatic nucleus (SCN) which regulates the sleep/wake cycle (see page 50). There is evidence that this particular brain structure shrinks in all animals during spring and expands throughout autumn (Tramontin and Brenowitz 2000).

However, much of the work on seasonal plasticity has been done on animals, most notably songbirds. Human behaviour may be controlled differently.

Consider: *How useful is such research in understanding plasticity?*

Evaluation

Real-world application

One strength of functional recovery research is its real-world application.

Understanding the processes involved in plasticity has contributed to the field of neurorehabilitation. Simply understanding that axonal growth is possible encourages new therapies to be tried. For example constraint-induced movement therapy is used with stroke patients whereby they repeatedly practise using the affected part of their body (such as an arm) while the unaffected arm is restrained.

This shows that research into functional recovery is useful as it helps medical professionals know when interventions need to be made.

Cognitive reserve

One limitation of functional recovery is that level of education may influence recovery rates.

Eric Schneider *et al*. (2014) revealed that the more time people with a brain injury had spent in education – taken as an indication of their 'cognitive reserve' – the greater their chances of a disability-free recovery (DFR). 40% of those who achieved DFR had more than 16 years' education compared to about 10% of those who had less than 12 years' education.

This would imply that people with brain damage who have insufficient DFR are less likely to achieve a full recovery.

Evaluation eXtra

Small samples

Research is ongoing for new treatments to aid functional recovery. For instance, a study by Soma Banerjee *et al*. (2014) treated people who had a *total anterior circulation stoke* (TACS) with stem cells. All participants in this trial recovered compared to the more typical level of just 4% recovery.

However this study drew conclusions based on just five participants and no control group, which is fairly typical of research on functional recovery.

Consider: *What conclusions can we draw from such research?*



Apply it Concepts

Meditation and mindfulness

Meditation and mindfulness may alter the structure and function of the brain. Sara Lazar *et al*. (2005), using MRI scans, demonstrated how experienced meditators had a thicker cortex than non-meditators, particularly in areas related to attention and sensory processing. Individuals who took part in an 8-week Mindfulness-Based Stress Reduction course showed an increase in grey matter in the left hippocampus, a part of the brain strongly associated with learning and memory (Holzel *et al*. 2011). Finally, Yi-Yuan Tang *et al*. (2012) found that four weeks of meditation resulted in an increase in white matter in the *anterior cingulate cortex*, a part of the brain that contributes to self-regulation and control (a key aspect of meditational practice).

Question

Can you think of examples of other everyday behaviours that could alter the structure and/or function of the brain?

Apply it Methods

The case of Gabby Giffords

Gabby Giffords is a former US Democratic politician who survived an assassination attempt in 2011 when she was shot in the head from point blank range. Doctors placed Giffords into a waking coma such was the critical nature of her condition. Within months, however, she had made astonishing progress. With the aid of physical rehabilitation, Giffords was able to walk under supervision with perfect control of her left arm and leg, and able to write with her left hand. She could read, understand and speak in short phrases. Doctors suggested that Giffords' progress would place her in the top 5% of people recovering from serious brain injury – a remarkable example of the brain's plasticity.

Question

With reference to the example of Gabby Giffords above, briefly discuss strengths and limitations of the case study approach. (*6 marks*)

Check it

1. Explain what is meant by 'plasticity' in the brain. *[3 marks]*
2. Outline what research has shown about functional recovery of the brain after trauma. *[4 marks]*
3. Discuss research into plasticity **and** functional recovery of the brain after trauma. *[16 marks]*

Ways of studying the brain

The specification says...

> Ways of studying the brain: scanning techniques, including functional magnetic resonance imaging (fMRI); electroencephalograms (EEGs) and event-related potentials (ERPs); post-mortem examinations.

Advances in science and technology have produced ever more sophisticated and precise methods of studying the brain. Some modern scanning techniques are able to record global neural activity through the assessment of brainwave patterns. Other techniques, meanwhile, are able to home in on activity in specific parts of the brain as the brain performs certain tasks and processes.

Another more traditional way of investigating the brain – the post-mortem – is also considered.

Key terms

Functional magnetic resonance imaging (fMRI) A method used to measure brain activity while a person is performing a task. fMRI detects radio waves from changing magnetic fields. This enables researchers to detect which regions of the brain are rich in oxygen and thus are active.

Electroencephalogram (EEG) A record of the tiny electrical impulses produced by the brain's activity. By measuring characteristic wave patterns, the EEG can help diagnose certain conditions of the brain.

Event-related potentials (ERPs) The electrophysiological response of the brain to a specific sensory, cognitive, or motor event can be isolated through statistical analysis of EEG data.

Post-mortem examinations The brain is analysed after death to determine whether certain observed behaviours during the person's lifetime can be linked to structural abnormalities in the brain.

Study tip

The term 'event-related potential' refers to the method used for studying the brain as well as what is examined/isolated as a result of that technique, i.e. a specific form of brainwave. In effect, the ERP technique produces the ERP!

Scanning and other techniques

Techniques for investigating the brain are often used for medical purposes in the diagnosis of illness. The purpose of scanning in psychological research is often to investigate **localisation** – to determine which parts of the brain do what.

Functional magnetic resonance imaging

Functional magnetic resonance imaging (fMRI) works by detecting the changes in both blood oxygenation and flow that occur as a result of neural (brain) activity in specific parts of the brain. When a brain area is more active it consumes more oxygen and to meet this increased demand, blood flow is directed to the active area (known as the *haemodynamic response*). fMRI produces three-dimensional images (activation maps) showing which parts of the brain are involved in a particular mental process and this has important implications for our understanding of localisation of function.

Electroencephalogram

An **electroencephalogram** (EEG) measures electrical activity within the brain via electrodes that are fixed to an individual's scalp using a skull cap. The scan recording represents the brainwave patterns that are generated from the action of thousands of neurons, providing an overall account of brain activity. EEG is often used by clinicians as a diagnostic tool as unusual *arrhythmic* patterns of activity (i.e. no particular rhythm) may indicate neurological abnormalities such as epilepsy, tumours or some sleep disorders.

Event-related potentials

Although EEG has many scientific and clinical applications, in its raw form it is a crude and overly general measure of brain activity. However, within EEG data are contained all the neural responses associated with specific sensory, cognitive and motor events that may be of interest to cognitive neuroscientists. As such, researchers have developed a way of teasing out and isolating these responses. Using a statistical averaging technique, all extraneous brain activity from the original EEG recording is filtered out leaving only those responses that relate to, say, the presentation of a specific stimulus or performance of a specific task. What remains are **event-related potentials** (ERPs) – types of brainwave that are triggered by particular events. Research has revealed many different forms of ERP and how, for example, these are linked to cognitive processes such as attention and perception.

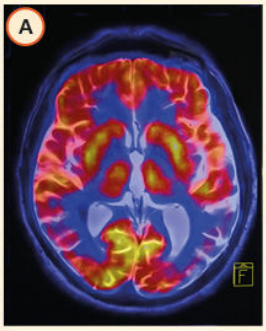
Post-mortem examinations

This is a technique involving the analysis of a person's brain following their death. In psychological research, individuals whose brains are subject to a **post-mortem examination** are likely to be those who have a rare disorder and have experienced unusual deficits in cognitive processes or behaviour during their lifetime. Areas of damage within the brain are examined after death as a means of establishing the likely cause of the affliction the person experienced. This may also involve comparison with a **neurotypical** brain in order to ascertain the extent of the difference.

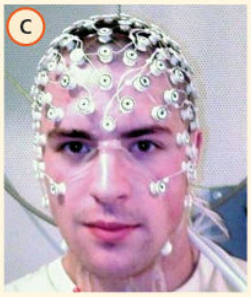
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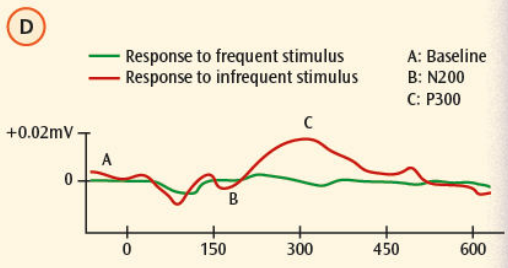
Concepts — Match the picture to the techniques

Do the pictures (A, B, C and D) relate to fMRI, EEG, ERPs or post-mortems?









Evaluation

Functional magnetic resonance imaging

Strengths One key strength of fMRI is, unlike other scanning techniques such as **PET**, it does not rely on the use of radiation. If administered correctly it is virtually risk-free, non-invasive and straightforward to use. It also produces images that have very high spatial resolution, depicting detail by the millimetre, and providing a clear picture of how brain activity is localised. This means that fMRI can safely provide a clear picture of brain activity.

Limitation fMRI is expensive compared to other neuroimaging techniques. It has poor *temporal* resolution because there is around a 5-second time-lag behind the image on screen and the initial firing of neuronal activity. This means fMRI may not truly represent moment-to-moment brain activity.

Electroencephalogram

Strengths EEG has been useful in studying the stages of sleep (see page 48) and in the diagnosis of conditions such as epilepsy, a disorder characterised by random bursts of activity in the brain that can easily be detected on screen. Unlike fMRI, EEG technology has extremely high temporal resolution. Today's EEG technology can accurately detect brain activity at a resolution of a single millisecond (and even less in some cases). This shows the real-world usefulness of the technique.

Limitations The main drawback of EEG lies in the generalised nature of the information received (that of many thousands of neurons). The EEG signal is also not useful for pinpointing the exact source of neural activity. Therefore it does not allow researchers to distinguish between activities originating in different but adjacent locations.

Event-related potentials

Strengths The limitations of EEG are partly addressed through the use of ERPs. These bring much more specificity to the measurement of neural processes than could ever be achieved using raw EEG data. As ERPs are derived from EEG measurements, they have excellent temporal resolution, especially when compared to neuroimaging techniques such as fMRI. This means that ERPs are frequently used to measure cognitive functions and deficits such as the allocation of attentional resources and the maintenance of **working memory**.

Limitations Critics have pointed to a lack of standardisation in ERP methodology between different research studies which makes it difficult to confirm findings. A further issue is that, in order to establish pure data in ERP studies, background 'noise' and extraneous material must be completely eliminated. This is a problem because it may not always be easy to achieve.

Post-mortem examinations

Strengths Post-mortem evidence was vital in providing a foundation for early understanding of key processes in the brain. Paul Broca and Karl Wernicke (see page 38) both relied on post-mortem studies in establishing links between language, brain and behaviour decades before neuroimaging ever became a possibility. Post-mortem studies were also used to study HM's brain to identify the areas of damage, which could then be associated with his memory deficits (HM's case was discussed in our Year 1 book). This means post-mortems continue to provide useful information.

Limitations Causation is an issue within these studies, however. Observed damage to the brain may not be linked to the deficits under review but to some other unrelated trauma or decay. A further problem is that post-mortem studies raise ethical issues of consent from the individual before death. Participants may not be able to provide **informed consent**, for example in the case of HM who lost his ability to form memories and was not able to provide such consent – nevertheless post-mortem research has been conducted on his brain. This challenges the usefulness of post-mortem studies in psychological research.

Apply it Concepts — FMRI and lie detection

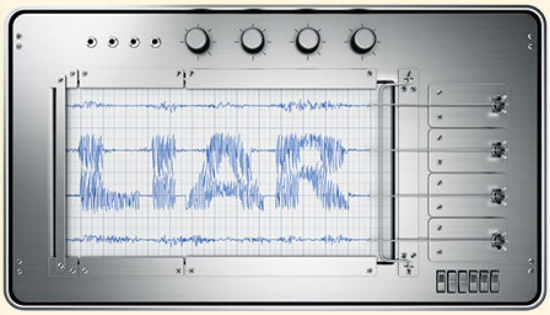
One innovative and recently emerging application of fMRI has been in the field of lie detection. Many have claimed that fMRI is an ideal tool for detecting truthfulness (or more pertinently, the lack of it) due to its ability to effectively see *inside* the brain. Supporters of its use argue that the analysis of neural blood flow is preferable to tracking peripheral measures of anxiety – such as changes in pulse, skin temperature or respiration – that would be recorded by more traditional lie detectors or polygraphs (such as those employed by police detectives). Traditional lie detectors are widely acknowledged as 'beatable', but neural activity is much more difficult to fake!

Two US companies, Cephos (in Pepperell, Massachusetts) and the catchily-named No Lie MRI (in Tarzana, California), claim to predict with over 90 percent accuracy whether its clients are 'spinning a line'. No Lie MRI suggests that the technique may even be used for 'risk reduction in dating'.

Many neuroscientists and legal scholars doubt such claims – and some even question whether brain scans for lie detection will ever move beyond the research lab into the real world.

Question

What are the strengths *and* limitations of using fMRI as a method of lie detection?



In the future, will the truth in criminal trials be established using brain scanning techniques?

Apply it Methods — Memory lane

A researcher used an fMRI scan to investigate whether different types of long-term memories are located in different parts of the brain. Participants were asked to think about family holidays they had been on as a child and their brain activity was recorded. The same participants were then asked to mentally 'list' European capital cities and their brain activity was again recorded to see if there was a difference.

Question

The research described above could be considered to be a **lab experiment**. Briefly discuss strengths *and* limitations of lab experiments with reference to the research above. *(6 marks)*

Check it

1. Outline **one** difference between EEGs and ERPs as ways of studying the brain. *[2 marks]*
2. Briefly evaluate post-mortem examinations as a way of studying the brain. *[4 marks]*
3. Describe **and** evaluate scanning techniques as a way of studying the brain. *[16 marks]*

Biological rhythms: Circadian rhythms

The specification says...

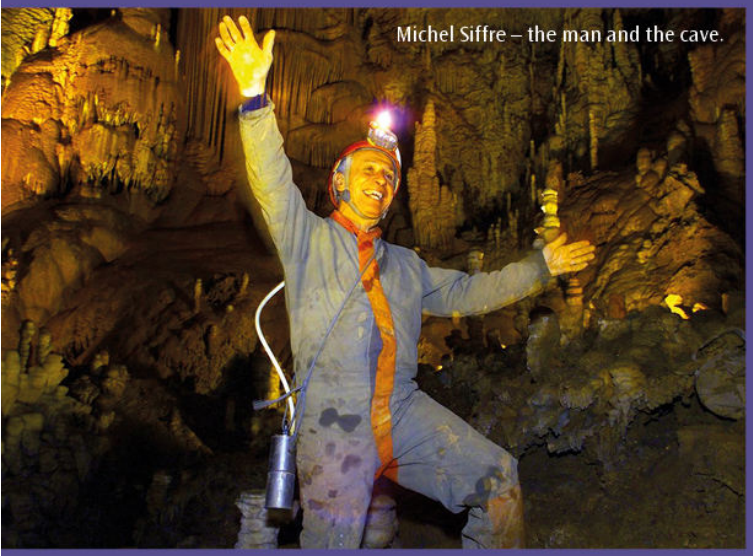
Biological rhythms: circadian rhythms.

A biological rhythm is a change in body processes or behaviour that repeats regularly (i.e. a cycle). For instance, most of us show a distinct pattern of going to sleep when it's dark and waking up when it's light. This is an example of a circadian rhythm – a specific type of bodily rhythm that occurs across a 24-hour period.

Key terms

Biological rhythms Distinct patterns of changes in body activity that conform to cyclical time periods. Biological rhythms are influenced by internal body clocks (endogenous pacemakers) as well as external changes to the environment (exogenous zeitgebers).

Circadian rhythms Biological rhythms, subject to a 24-hour cycle, which regulate a number of body processes such as the sleep/wake cycle and changes in core body temperature.



Michel Siffre – the man and the cave.

Apply it Concepts

Core body temperature

Core body temperature varies by around two degrees centigrade during the course of a day. It is at its lowest around 4 in the morning (36°C) and peaks around 6 in the evening at 38°C. Evidence suggests that body temperature may have an effect on our mental abilities – the warmer we are (internally), the better our cognitive performance.

Simon Folkard *et al.* (1977) demonstrated how children who had stories read to them at 3 pm showed superior recall and comprehension after a week compared to children who heard the same stories at 9 am. Similarly, Sunita Gupta (1991) found improved performance on IQ tests when participants were assessed at 7 pm as opposed to 2 pm and 9 am.

Question

Given the findings from these studies, when would be a good time of day to take your psychology exam?

Circadian rhythms

Biological rhythms

All living organisms – plants, animals and people – are subject to **biological rhythms** and these exert an important influence on the way in which body systems behave. All biological rhythms are governed by two things – the body's internal biological 'clocks', which are called **endogenous pacemakers** and external changes in the environment known as **exogenous zeitgebers** (see page 50). Some of these rhythms occur many times during the day (**ultradian rhythms**). Others take longer than a day to complete (**infradian rhythms**) and in some cases much longer (*circannual rhythms*).

Circadian rhythms are those rhythms that last for around 24 hours (*circa* is Latin for 'about' and *diem* for 'day'). Two examples of circadian rhythms are the sleep/wake cycle and core body temperature (see Apply it, below).

The sleep/wake cycle

The fact that we feel drowsy when it's night-time and alert during the day demonstrates the effect of daylight – an important exogenous zeitgeber – on our sleep/wake cycle.

However the sleep/wake cycle is also governed by an internal (endogenous) pacemaker – a biological 'clock' called the *suprachiasmatic nucleus* (SCN). The SCN lies just above the optic chiasm which provides information from the eye about light. Exogenous zeitgebers (light) can reset the SCN.

What if the biological clock was 'left to its own devices' without the influence of external stimuli such as light (what researchers refer to as 'free-running')? If we had no idea whether it was night or day would we still fall asleep and wake up at regular times? Researchers have tried to answer this question.

Siffre's cave study

Michel Siffre (pronounce '*Seef*') is a self-styled caveman who has spent several extended periods underground to study the effects on his own biological rhythms. Deprived of exposure to natural light and sound, but with access to adequate food and drink, Siffre resurfaced in mid-September 1962 after two months in the caves of the Southern Alps believing it to be mid-August! A decade later he performed a similar feat but this time for six months in a Texan cave.

In each case, his 'free-running' biological rhythm settled down to one that was just beyond the usual 24 hours (around 25 hours) though he did continue to fall asleep and wake up on a regular schedule.

Other research

Similar results were recorded by Jürgen Aschoff and Rütger Wever (1976) who convinced a group of participants to spend four weeks in a World War 2 bunker deprived of natural light. All but one of the participants (whose sleep/wake cycle extended to 29 hours) displayed a circadian rhythm between 24 and 25 hours. Both Siffre's experience and the bunker study suggest that the 'natural' sleep/wake cycle may be slightly longer than 24 hours but that it is *entrained* by exogenous zeitgebers associated with our 24-hour day (such as the number of daylight hours, typical mealtimes, etc.).

Despite this, we should not overestimate the influence of exogenous zeitgebers on our internal biological clock. Simon Folkard *et al.* (1985) studied a group of 12 people who agreed to live in a dark cave for three weeks, retiring to bed when the clock said 11.45 pm and rising when it said 7.45 am. Over the course of the study, the researchers gradually speeded up the clock (unbeknown to the participants) so an apparent 24-hour day eventually lasted only 22 hours! It was revealed that only one of the participants was able to comfortably adjust to the new regime. This would suggest the existence of a strong free-running circadian rhythm that cannot easily be overridden by exogenous zeitgebers.

Study tip

Remember, when asked about 'research' you can refer to both theories/explanations and/or research studies. So writing about 'research into circadian rhythms' could include details of specific studies as well as broader explanations of the effects of such rhythms.

Evaluation

Shift work

One strength of research into circadian rhythms is that it provides an understanding of the adverse consequences that occur when they are disrupted *(desynchronisation)*.

For example, night workers engaged in shift work experience a period of reduced concentration around 6 in the morning (a circadian trough) meaning mistakes and accidents are more likely (Boivin *et al*. 1996). Research has also pointed to a relationship between shift work and poor health – shift workers are three times more likely to develop heart disease than people who work more typical work patterns (Knutsson 2003).

This shows that research into the sleep/wake cycle may have real-world economic implications in terms of how best to manage worker productivity.

Counterpoint However, studies investigating the effects of shift work tend to use correlational methods. This means it is difficult to establish whether desynchronisation of the sleep/wake cycle is actually a cause of negative effects. There may be other factors. For example, Charlene Solomon (1993) concluded that high divorce rates in shift workers might be due to the strain of deprived sleep and other influences such as missing out on important family events.

This suggests that it may not be biological factors that create the adverse consequences associated with shift work.

Medical treatment

Another strength of research into circadian rhythms is that it has been used to improve medical treatments.

Circadian rhythms co-ordinate a number of the body's basic processes such as heart rate, digestion and hormone levels. These rise and fall during the course of a day which has led to the field of *chronotherapeutics* – how medical treatment can be administered in a way that corresponds to a person's biological rhythms. For example aspirin as a treatment for heart attacks is most effective if taken last thing at night. Aspirin reduces blood platelet activity and this can reduce the risk of heart attack. Heart attacks are most likely to occur early in the morning, so the timing of taking aspirin matters. Research has supported this (e.g. Bonten *et al*. 2015).

This shows that circadian rhythm research can help increase the effectiveness of drug treatments.

Individual differences

One limitation of research into circadian rhythms is that generalisations are difficult to make.

The studies described on the facing page (Aschoff and Wever, and Siffre) are based on very small samples of participants (just one in the case of Siffre). It seems that sleep/wake cycles may vary widely from person to person. Research by Charles Czeisler *et al*. (1999) found individual differences in sleep/wake cycles varying from 13 to 65 hours. In addition, a study by Jeanne Duffy *et al*. (2001) revealed that some people have a natural preference for going to bed early and rising early (known as 'larks') whereas others prefer the opposite ('owls'). Even Siffre, in a later 1999 study, observed that his own sleep/wake cycle had slowed down since he was a young man.

This means that it is difficult to use the research data to discuss anything more than averages, which may be meaningless.

Evaluation eXtra

Shifting the school day

A number of researchers (e.g. Wolfson and Carskadon 1998) recommend that the school day start a couple of hours later to fit in with the typical teenage *chronotype* (sleep pattern). Hormonal shifts in the teenage body mean that getting to sleep becomes more difficult and therefore adolescent students tend to be rather sleepy at the start of the school day. Research has shown benefits for academic and behavioural performance when lessons start later in the day, including reduced dependence on caffeine (Adolescent Sleep Working Group 2014).

However, shifting the start of the day is disruptive for parents and teachers, and it limits the number of extracurricular activities after school. Also, critics of the proposal suggest that a later school day would not actually reduce sleep deprivation, it would simply mean that teenagers would stay up later and still be exhausted!

Consider: *Do you think the pros of a later start to the school day outweigh the cons?*



Apply it Concepts — Jed's working week

Jed is a factory worker who works changing shifts. Jed will do a daytime shift for a week (9 am to 5 pm) followed by a week of night shifts (10 pm to 6 am).

Jed has been diagnosed with stress and high blood pressure, and takes sleeping pills particularly on the weeks he does the night shift, as he often struggles to sleep during the day. He is frequently absent from work due to illness. His doctor says that Jed needs to improve his diet and take more regular exercise.

Jed's stress levels are not helped by the fact that he is soon to face a disciplinary meeting at work. During a night shift he made several mistakes that resulted in some expensive warehouse machinery breaking down which the company had to replace.

Question

Using your knowledge of circadian rhythms and the sleep/wake cycle, explain the problems that Jed is experiencing.

Apply it Methods — Meta-analysis

A researcher conducted a meta-analysis of studies that investigated the length of the sleep/wake cycle. As a result of the meta-analysis, the researcher concluded that the average length of the sleep/wake cycle is between 24 and 25 hours.

Questions

1. Explain what is meant by a 'meta-analysis'. Refer to this research in your answer. (*2 marks*)
2. Outline *one* strength and *one* limitation of conducting a meta-analysis. Refer to this research in your answer. (*4 marks*)
3. Briefly discuss the implications of psychological research for the economy. Refer to the research above in your answer. (*4 marks*)
4. The studies of the sleep/wake cycle the researcher analysed were from a number of neuroscience journals and had all been through a process of **peer review.** Outline and briefly discuss the role of peer review in psychological research. (*8 marks*)

Check it

1. Outline **one** example of a circadian rhythm. *[3 marks]*
2. Describe what research on circadian rhythms has shown about biological rhythms in general. *[4 marks]*
3. Discuss research into circadian rhythms. *[16 marks]*

Biological rhythms: Infradian and ultradian rhythms

The specification says...

Biological rhythms: infradian and ultradian rhythms.

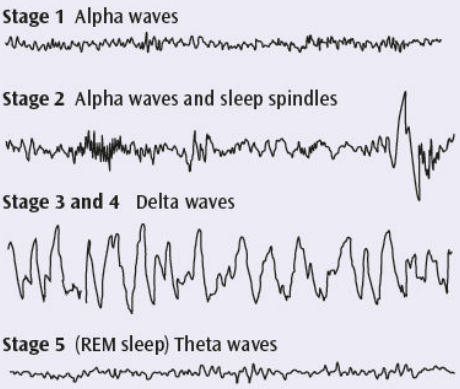
Infradian rhythms are those that take longer than 24 hours to complete. Here, we discuss two examples of these – the menstrual cycle and seasonal affective disorder (SAD).

Also featured on this spread are the stages of sleep (more commonly referred to as the *sleep cycle*). The sleep cycle is an example of an ultradian rhythm – one that takes less than 24 hours to complete and occurs more than once over the course of a day.

Key terms

Infradian rhythm A type of biological rhythm with a frequency of less than one cycle in 24 hours, such as menstruation and seasonal affective disorder.

Ultradian rhythm A type of biological rhythm with a frequency of more than one cycle in 24 hours, such as the stages of sleep (the sleep cycle).



These show the different brainwave patterns during sleep. Brainwaves are called 'waves' because they rise and fall. There are two features of waves. First is the time between each peak (described as the frequency of the wave) and second is the height of each peak which represents amount of electrical activity (described as amplitude).

Apply it

Concepts EEGs and sleep

EEGs (electroencephelograms) are used to measure brainwaves in controlled laboratories. This enables researchers to describe the changes in neural activity during sleep. Digitalised computer images of brainwaves have replaced paper printouts in the last few years as the technology has become more sophisticated. Participants are usually required to arrive at the lab having missed a night's sleep so they are able to 'drift off' relatively quickly.

Question

What are the strengths and limitations of EEGs in the context of this research?

Infradian rhythms

The menstrual cycle

The menstrual cycle, an example of an **infradian rhythm**, is governed by monthly changes in hormone levels which regulate ovulation. The cycle refers to the time between the first day of a woman's period, when the womb lining is shed, to the day before her next period. The typical cycle takes approximately 28 days to complete (though anywhere between 24 and 35 days is generally considered normal). During each cycle, rising levels of the hormone **oestrogen** cause the ovary to develop an egg and release it (ovulation). After ovulation, the hormone *progesterone* helps the womb lining to grow thicker, readying the womb for pregnancy. If pregnancy does not occur, the egg is absorbed into the body, the womb lining comes away and leaves the body (the menstrual flow).

Synchonising the menstrual cycle

Although the menstrual cycle is an **endogenous** system, evidence suggests that it may be influenced by **exogenous** factors, such as the cycles of other women. A study by Kathleen Stern and Martha McClintock (1998) demonstrated how menstrual cycles may synchronise as a result of the influence of pheromones.

Stern and McClintock studied 29 women with a history of irregular periods. Samples of **pheromones** were gathered from nine of the women at different stages of their menstrual cycles, via a cotton pad placed in their armpit. The pads were worn for at least 8 hours to ensure that pheromones were picked up. The pads were treated with alcohol and frozen, to be rubbed on the upper lip of the other participants. On day one, pads from the start of the menstrual cycle were applied to all 20 women, on day two they were all given a pad from the second day of the cycle, and so on. Stern and McClintock found that 68% of women experienced changes to their cycle which brought them closer to the cycle of their 'odour donor'.

Seasonal affective disorder

Seasonal affective disorder (SAD) is a depressive disorder which has a seasonal pattern of onset, and is described and diagnosed as a mental disorder in **DSM-5**. As with other forms of **depression**, the main symptoms of SAD are persistent low mood alongside a general lack of activity and interest in life. SAD is often referred to as the *winter blues* as the symptoms are triggered during the winter months when the number of daylight hours becomes shorter. SAD is a particular type of infradian rhythm called a *circannual rhythm* as it is subject to a yearly cycle. However, it can also be classed as a **circadian rhythm** as the experience of SAD may be due to the disruption of the sleep/wake cycle and this can be attributed to prolonged periods of daily darkness during winter.

Psychologists have hypothesised that the **hormone melatonin** is implicated in the cause of SAD. During the night, the *pineal gland* (see next spread) secretes melatonin until dawn when there is an increase in light. During winter, the lack of light in the morning means this secretion process continues for longer. This is thought to have a knock-on effect on the production of **serotonin** in the brain – a chemical that has been linked to the onset of depressive symptoms.

Ultradian rhythms

One of the most intensively researched **ultradian rhythms** is the stages of sleep – the sleep cycle. Psychologists have identified five distinct stages of sleep that altogether span approximately 90 minutes – a cycle that continues throughout the course of the night. Each of these stages is characterised by a different level of brainwave activity which can be monitored using an **EEG** (see page 44).

Stages 1 and 2 This is light sleep where a person may be easily woken. In stage 1, brain waves are high frequency and have a short amplitude. These are *alpha waves* (see diagram on left). In stage 2, the alpha waves continue but there are occasional random changes in pattern called *sleep spindles*.

Stages 3 and 4 This is known as deep sleep or *slow wave sleep* (SWS). The brain waves are *delta waves* with lower frequency and higher amplitude. It is difficult to wake someone at this point.

Stage 5 (REM sleep) The body is paralysed yet brain activity closely resembles that of the awake brain. During this time, the brain produces *theta waves* and the eyes occasionally move around, thus *rapid eye movement* (REM). Dreams are most often experienced during REM sleep, but may also occur in deep sleep.

Evaluation

Evolutionary basis

One strength of menstrual synchrony research is that it may be explained by natural selection.

Synchronisation of the menstrual cycle, of the kind observed in the Stern and McClintock study (facing page), is thought by some to have evolutionary value. For our distant ancestors it may have been advantageous for women to menstruate together and become pregnant at the same time. In a social group, this would allow babies who had lost their mothers during or after childbirth to have access to breast milk, thereby improving their chances of survival.

This suggests that synchronisation is an adaptive strategy.

Methodological limitations

One limitation of synchronisation studies is their methodological shortcomings.

There are many factors that may effect change to the menstrual cycle, including stress, changes in diet, exercise, etc. These may act as **confounding variables**, which means that any supposed pattern of synchronisation is no more than would have been expected to occur by chance. This may explain why other studies (e.g. Trevathan *et al.* 1993) have failed to **replicate** the findings.

This suggests that menstrual synchrony studies are flawed.

Evaluation eXtra

Real-world application

One of the most effective treatments for seasonal affective disorder is light therapy, a box which simulates very strong light to reset the body's internal clock. Studies show this helps reduce the effects of SAD in about 80% of people (Sanassi 2014). Light therapy is also preferred over antidepressants to treat SAD because it is regarded as safe.

That said, light therapy can produce headaches and eye strain. Perhaps more tellingly, Kelly Rohan *et al.* (2009) recorded a relapse rate of 46% over successive winters, compared to 27% in a comparison group receiving CBT.

Consider: *Should phototherapy be used?*

Evaluation

Improved understanding

One strength of research into ultradian rhythms is that it has improved understanding of age-related changes in sleep.

Sleep scientists have observed that SWS reduces with age. Growth hormone is mostly produced during SWS therefore this is reduced in older people. According to Eve van Cauter *et al.* (2000), the resulting sleep deficit may explain various issues in old age, such as reduced alertness. In order to increase SWS, relaxation and medication may be used.

This suggests that knowledge of ultradian rhythms has practical value.

Individual differences

One limitation of ultradian rhythms research is there is significant variation between people.

Adrienne Tucker *et al.* (2007) found large differences between participants in terms of the duration of each sleep stage, particularly stages 3 and 4. Tucker *et al.* suggest that these differences are likely to be biologically determined.

This makes it difficult to describe 'normal sleep' in any meaningful way.

Evaluation eXtra

The sleep lab

One of the benefits of conducting studies of sleep in lab settings is the control of **extraneous variables**. This means that a researcher can exclude temporary variables such as noise or temperature that may affect sleep.

However, lab studies involve being attached to complicated machinery, leading participants to sleep in a way that does not represent their ordinary sleep patterns.

Consider: *Would it be better to conduct studies of sleep at participants' own homes?*



According to Ericsson *et al.* and the basic rest-activity cycle, the key to world-class violin playing is having a break every 90 minutes. Now that I can do...

Apply it
Concepts

The Basic rest-activity cycle

Evidence suggests the existence of the 90-minute cycle during sleep (see facing page). Nathaniel Kleitman (1969) also suggested that a similar 90-minute rhythm cycle continues during waking hours. He called this the *Basic rest-activity cycle* (BRAC) which is characterised by a period of alertness followed by a spell of physiological fatigue. This recurs during the course of the day.

Anecdotal evidence supports the existence of BRAC such as the frequent observation that students find it difficult to concentrate for periods longer than 90 minutes at a time.

In a widely-cited study of prodigious violinists, K. Anders Ericsson *et al.* (1993) found that the best performers tended to practise for three sessions during the course of the day, each session lasted no more than 90 minutes, and there was a break between each in order to 'recharge'.

Question

Explain what type of rhythm BRAC is. Justify your answer.

Apply it
Methods

SAD

In a study, people with *seasonal affective disorder* (SAD) were divided into two different groups:

Group 1 received phototherapy treatment.

Group 2 received no treatment.

The progress of the two groups was studied for the same length of time during the winter period. At the end of the study, all participants were required to complete a questionnaire which assessed their mood and the difference in mood scores between the two groups was calculated.

Question

1. Explain the purpose of Group 2 in the study above. *(3 marks)*
2. Which **statistical test** would be most appropriate to analyse the difference in mood scores between Group 1 and Group 2 in the study above? Justify your answer. *(4 marks)*

Check it

1. Outline **one** example of an ultradian rhythm. *[2 marks]*
2. Describe what psychological research has shown about infradian rhythms. *[4 marks]*
3. Discuss research into infradian **and/or** ultradian rhythms. *[16 marks]*

Endogenous pacemakers and exogenous zeitgebers

The specification says...

The effect of endogenous pacemakers and exogenous zeitgebers on the sleep/wake cycle.

Biological rhythms are influenced by two things – internal body clocks (endogenous pacemakers) and external cues in the environment (exogenous zeitgebers). As with nature and nurture in psychology, it is very difficult to separate the relative influence of pacemakers and zeitgebers as they are so closely linked.

Key terms

Endogenous pacemakers Internal body clocks that regulate many of our biological rhythms, such as the influence of the suprachiasmatic nucleus (SCN) on the sleep/wake cycle.

Exogenous zeitgebers External factors that affect or *entrain* our biological rhythms, such as the influence of light on the sleep/wake cycle.

Sleep/wake cycle A daily cycle of biological activity based on a 24-hour period (circadian rhythm) that is influenced by regular variations in the environment, such as the alternation of night and day.



If you're a fan of chipmunks, the DeCoursey study (above right) is probably best avoided.

Apply it Concepts

Use of studies

You shouldn't be short of studies to illustrate the effects of endogenous pacemakers and exogenous zeitgebers.

Question

Explain how the following studies could be used to support the influence of endogenous pacemakers *and* exogenous zeitgebers:

- Siffre.
- Aschoff and Wever.
- Stern and McClintock.

Endogenous pacemakers and the sleep/wake cycle

The suprachiasmatic nucleus

The *suprachiasmatic nucleus* (SCN) was introduced on page 46. It is a tiny bundle of nerve cells located in the **hypothalamus** in each **hemisphere** of the brain. It is one of the primary **endogenous pacemakers** in mammalian species (including humans) and is influential in maintaining **circadian rhythms** such as the **sleep/wake cycle**. Nerve fibres connected to the eye cross in an area called the *optic chiasm* on their way to the left and right **visual area** of the **cerebral cortex**. The SCN lies just above the optic chiasm ('supra' means 'above'). It receives information about light directly from this structure. This continues even when our eyes are closed, enabling the biological clock to adjust to changing patterns of daylight whilst we are asleep.

Animal studies and the SCN

The influence of the SCN has been demonstrated in studies involving animals. Patricia DeCoursey *et al.* (2000) destroyed the SCN connections in the brains of 30 chipmunks who were then returned to their natural habitat and observed for 80 days. The sleep/wake cycle of the chipmunks disappeared and by the end of the study a **significant** proportion of them had been killed by predators (presumably because they were awake, active and vulnerable to attack when they should have been asleep).

In another study, Martin Ralph *et al.* (1990) bred 'mutant' hamsters with a 20-hour sleep/wake cycle. When SCN cells from the foetal tissue of mutant hamsters were transplanted into the brains of normal hamsters, the cycles of the second group defaulted to 20 hours.

The pineal gland and melatonin

The SCN passes the information on day length and light that it receives to the *pineal gland* (a pea-like structure in the brain just behind the hypothalamus). This is another endogenous mechanism guiding the sleep/wake cycle. During the night, the pineal gland increases production of **melatonin** – a chemical that induces sleep and is inhibited during periods of wakefulness. Melatonin has also been suggested as a causal factor in **seasonal affective disorder** (see previous spread).

Exogenous zeitgebers and the sleep/wake cycle

The German word *zeitgeber* means 'time giver'. **Exogenous zeitgebers** are external factors in the environment that reset our biological clocks through a process known as *entrainment*. We have seen that, in the absence of external cues, the free-running biological clock that controls the sleep/wake cycle continues to 'tick' in a distinct cyclical pattern (as in the Siffre study – see page 46). This free-running cycle is then 'brought into line' (i.e. entrained) by environmental cues, so there is an interaction of internal and external factors.

Light

Light is a key zeitgeber in humans. It can reset the body's main endogenous pacemaker, the SCN, and thus plays a role in the maintenance of the sleep/wake cycle. Light also has an indirect influence on key processes in the body that control such functions as **hormone** secretion and blood circulation.

In an innovative study, Scott Campbell and Patricia Murphy (1998) demonstrated that light may be detected by skin receptor sites on the body even when the same information is not received by the eyes. Fifteen participants were woken at various times and a light pad was shone on the back of their knees. The researchers managed to produce a deviation in the participants' usual sleep/wake cycle of up to three hours in some cases! This suggests that light is a powerful exogenous zeitgeber that need not necessarily rely on the eyes to exert its influence on the brain.

Social cues

As every parent knows, babies are seldom on the same sleep/wake cycle as the rest of the family, in fact newborn babies' initial sleep/wake cycle is pretty much random. At about 6 weeks of age, the circadian rhythms begin and, by about 16 weeks, babies' rhythms have been entrained by the schedules imposed by parents, including adult-determined mealtimes and bedtimes.

Research on jet lag suggests that adapting to local times for eating and sleeping (rather than responding to one's own feelings of hunger and fatigue) is an effective way of entraining circadian rhythms and beating jet lag when travelling long distances.

Practical activity on page 52

Evaluation

Beyond the master clock

One limitation of SCN research is that it may obscure other body clocks.

Research has revealed that there are numerous circadian rhythms in many organs and cells in the body. These *peripheral oscillators* are found in the organs including the lungs, pancreas and skin. They are influenced by the actions of the SCN, but also act independently. Francesca Damiola *et al.* (2000) demonstrated how changing feeding patterns in mice could alter the circadian rhythms of cells in the liver by up to 12 hours, whilst leaving the rhythm of the SCN unaffected.

This suggests other complex influences on the sleep/wake cycle.

Interactionist system

Another limitation is that endogenous pacemakers cannot be studied in isolation.

Total isolation studies, such as Michael Siffre's cave study (see page 46) are extremely rare. Remember also that Siffre made use of artificial light which could have reset his biological clock every time he turned his lamp on. In everyday life, pacemakers and zeitgebers interact, and it may make little sense to separate the two for the purpose of research.

This suggests the more researchers attempt to isolate the influence of internal pacemakers, the lower the validity of the research.

Evaluation eXtra

Ethics

Animal studies of the sleep/wake cycle are justified because there are very similar mechanisms at work across species. The existence of an SCN and pineal gland in the brains of, say, chipmunks and hamsters means that generalisations can be made to the human brain, as the mammalian brain has similar structures.

However, a more disturbing issue is the ethics involved in such research. The animals in the DeCoursey *et al.* study (facing page) were exposed to risk when returned to their natural habitat, and most died as a result.

Consider: *Does what we learn from these studies justify the unethical procedures?*

Evaluation

Environmental observations

One limitation is that exogenous zeitgebers do not have the same effect in all environments.

The experience of people who live in places where there is very little darkness in summer and very little light in winter tell a different story from the usual narrative. For instance, people who live within the Arctic Circle (e.g. the Inuits of Greenland) have similar sleep patterns all-year round, despite spending around six months in almost total darkness.

This suggests the sleep/wake cycle is primarily controlled by endogenous pacemakers that can override environmental changes in light.

Case study evidence

Another limitation is evidence challenges the role of exogneous zeitgebers.

Laughton Miles *et al.* (1977) recount the study of a young man, blind from birth, who had an abnormal circadian rhythm of 24.9 hours. Despite exposure to social cues, such as regular mealtimes, his sleep/wake cycle could not be adjusted.

This suggests that social cues alone are not effective in resetting the biological rhythm.

Evaluation eXtra

Age-related insomnia

Evidence suggests that people have poorer quality sleep as they get older. This may be due to natural changes in the circadian rhythm as we age, which means falling asleep earlier and broken sleep at night (Duffy *et al.* 2015).

However, studies have suggested that exogenous factors may be more responsible for the changes in sleep patterns amongst older people. Bernadette Hood *et al.* (2004) found that management of insomnia was improved if elderly people were generally more active and had more exposure to natural light.

Consider: *Are endogenous or exogenous factors more important?*



It's probably reasonable to assume that this man has some difficulty adjusting to his sleep/wake cycle.

Apply it Methods

Delayed sleep-phase disorder

Delayed sleep-phase disorder (DSPD) is a circadian rhythm sleep disorder. People with DSPD generally fall asleep some hours after midnight and find it very difficult to wake up in time for a typical work day.

Twenty people with DSPD were involved in a study. Researchers randomly allocated the 20 participants into two groups: Group A (treatment group) and Group B (control group).

Group A was given a course of drugs that increased melatonin production for six weeks at bedtime (around 11pm). Group B was given a placebo for the same period of time. At the end of the six-week period, all the participants were assessed on a number of self-report measures. These examined their performance at work, their attention levels during the day and their family relationships.

Questions

1. Suggest an appropriate **hypothesis** for the study above. (*2 marks*)
2. Explain *one* strength and *one* limitation of the **experimental design** used in this study. (*4 marks*)
3. Explain *one* way in which participants may have been **randomly allocated** to one of the two groups. (*2 marks*)
4. Explain *one* limitation with the use of **self-report measures** in this study. (*3 marks*)

Apply it Concepts

Jet lag

Jet lag is an important form of desynchronisation that can disrupt the sleep/wake cycle, causing sleeplessness, irritability and nausea, as the body struggles to adapt to changing time zones.

Question

Using research into endogenous pacemakers, what advice would you give would-be travellers on how best to minimise the negative effects of jet lag?

Check it

1. Using an example, explain what is meant by an 'endogenous pacemaker'. *[3 marks]*
2. Using examples, explain the difference between endogenous pacemakers and exogenous zeitgebers. *[4 marks]*
3. Discuss the effect of endogenous pacemakers **and** exogenous zeitgebers on the sleep/wake cycle. *[16 marks]*

Practical corner

The specification says...

> Knowledge and understanding of ... research methods, practical research skills and maths skills. These should be developed through ... ethical practical research activities.

This means you should conduct practical activities wherever possible. On this spread one activity is a correlational analysis to determine whether there is a relationship between the amount of exercise people do and the circadian rhythm of sleep. The other is also correlation, this time to see whether there is a relationship between how fast someone can run and their index finger to ring finger ratio. Confused? Read on ...

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?



Practical idea 1: The effects of exercise on sleep

The **aim** of this study is to explore whether there is a relationship between the amount of exercise done in a day and the sleep/wake cycle.

More specifically we are interested in whether there is a positive correlation between the number of hours' exercise people do and the number of hours' sleep they have over the course of a week.

The practical bit

It might be possible to test the relationship between levels of exercise and sleep patterns experimentally but this would involve depriving some participants of one or the other in order to manipulate the **independent variable**. So, we must rule out **experiments** for ethical reasons. An **observation** is a possibility too but participants would quickly become irritated by the constant presence of the researcher waiting patiently for them to break into a trot, and their nightly appearance at the end of the bed may well prove distracting! For practical and ethical reasons then, we would recommend that participants keep a record of how much exercise they do, as well as how much sleep they have, over a weekly period.

Recording data for each co-variable

As part of their involvement within the study, participants will be required to keep a simple diary of the number of hours they exercise and sleep over a weekly period. This may be more complicated than it sounds, though. The definition of what counts as 'exercise' may vary greatly from person to person. For some, lifting the remote control may constitute a rare feat of physical prowess. Whereas for others, a six-mile jog to the shops may barely draw a bead of sweat.

'Number of hours sleep' may also not be as self-evident as it sounds. Does this include a twenty-minute power nap before dinner at the end of a school day? Or the ten minutes that someone lost consciousness during an A level history video? For these reasons, it would be wise for you as a researcher to fully **operationalise** the **co-variables** in this study for the benefit of participants. This will involve drawing up a detailed list of what you define as 'exercise' and 'sleep' so participants can make accurate recordings at the end of each day.

Ethical issues

This study should be ethically acceptable as long as it is conducted well, but there are some issues to be aware of. Participants' data should remain **confidential**, not least because some may not want their data made public or shared with others. Some participants may be reluctant to report their data for reasons of, say, embarrassment so must be reminded that they have the **right to withdraw** their participation at any point. Participants may also need reassurance that the data they provide is 'normal' and so any **debrief** that is offered at the end of the study should be carefully worded.

Analysing your data

You will want to be able to display your results so that the relationship between the number of hours' exercise and the number of hours' sleep can be clearly seen. You should also use **inferential statistics**.

Apply it
Methods

The maths bit 1

1. In Table 1, what percentage of participants slept for less than 50 hours in the week they recorded data? (*2 marks*)
2. What percentage of participants exercised for more than 15 hours in the week they recorded data? (*2 marks*)
3. Which graphical display would be most suitable to show the relationship between number of hours' sleep and number of hours' exercise in Table 1? Explain your answer. (*2 marks*)
4. Sketch a suitable graphical display to show the relationship between number of hours' sleep and number of hours' exercise in Table 1. (*4 marks*)
5. Referring to Table 1, and the display you have drawn for question 4, explain the relationship between number of hours' sleep and number of hours' exercise. (*2 marks*)
6. Explain why, from this study, it is not possible to conclude that taking more exercise makes you sleep more. (*3 marks*)

Table 1 Total hours' sleep and exercise.

Ppt	Total hours' sleep in a week	Total hours' exercise in a week
1	56	17
2	63	21
3	58	10
4	42	5
5	34	2
6	70	23
7	54	11
8	60	17
9	50	14
10	49	8

Practical idea 2: Digit ratio and running speed

The aim of this study is to see if there is a correlation between the length of a person's index finger (2nd digit, 2D) and their ring finger (4th digit, 4D) ratio and how fast they can run.

In other words, is 2D:4D ratio related to sporting performance – specifically the time it takes someone to run 100 metres? This is based on a study by John Manning *et al.* (2001) who found that high 2D:4D ratio in males was associated with reduced performance in sport.



The practical bit

'Digit ratio' is the ratio of the lengths of different fingers measured from the midpoint of the bottom crease (where the finger joins the hand) to the tip of the finger. It has been suggested by a number of researchers that the ratio of the 2nd 'index finger' (the one you use for pointing) and the 4th 'ring finger' is affected by exposure to **androgens**, e.g. **testosterone**, whilst in the womb, with *lower* 2D:4D ratios pointing (no pun intended) to *higher* prenatal androgen exposure. Researchers investigating 2D:4D have linked digit ratio to a wide range of behaviours including **ADHD**, **schizophrenia**, **depression**, alcohol dependency and video game addiction.

Why running speed?

Clearly, none of the behaviours listed above are suitable territory for the study. However, a study by Manning *et al.* found that superior sporting ability in male participants was correlated with *low* 2D:4D ratio (a **negative correlation**). This is based on the theory that high testosterone (low 2D:4D ratio) may lead to the development of attributes that are useful in the sporting arena – including competitiveness and a general 'will to win'.

Manning *et al.*'s study focused on football ability in males, in particular professional footballers who had represented their country. It's probably a safe bet to assume that you don't know that many professional footballers (and even fewer that have reached international standard), so your task is to examine the relationship between 2D:4D ratio and how fast your male *and* female friends can run 100 metres.

Measuring the 2D:4D ratio

The 2D:4D ratio is calculated by dividing the length of the index finger of the right hand by the length of the ring finger of the right hand. A longer index finger will result in a ratio higher than 1, while a longer ring finger will result in a ratio of less than 1. It is likely that the lower 2D:4D ratios will be those of the male participants in your study – but not necessarily. There are wide individual differences in digit ratio and these may vary within and between the genders. Once you have measured and recorded 2D:4D ratios for all of your participants, you are ready to start the race.

Run participants, run ...

One thing we should have mentioned is how many participants you'll need. One of the co-variables will be determined by performance in a sprint – with everyone running at the same time – a cast of thousands is not really appropriate. It would be OK to organise a series of races if you manage to recruit quite a lot of participants but individual time trials are not an option. The point is that participants must be given the opportunity to show how competitive they are by running against each other, rather than on their own 'against the clock'.

You'll need a bit of a help

Despite your best efforts, it will be difficult to **replicate** Olympic-style running conditions in your 100 m race, and without access to sophisticated recording equipment, you're going to have to rely on a little help from your (non-participant) friends. Make sure you have enough people present on race day to ensure everybody's time is reasonably accurately recorded.



I've heard of someone winning a sprint 'by a nose', but by a couple of fingers ... Hmm.

The maths bit

Overall, at least 10% of the marks in assessments for Psychology will require the use of mathematical skills and this is included in the requirement that at least 25–30% in total will involve research methods.

Don't avoid it!

Table 2 Example data collected for participants' 2D:4D ratio and the time taken to run 100 metres.

Participant	1	2	3	4	5	6	7	8	9	10
2D:4D ratio	0.82	0.85	0.91	0.88	0.98	1.01	0.99	1.12	1.16	1.23
Time taken to run 100 metres (sec)	11.6	12.1	13.6	12.9	13.6	13.9	14.4	14.0	15.6	18.2

Apply it
Methods

The maths bit 2

1. Write a suitable **hypothesis** for this study. (*2 marks*)
2. Which **statistical test** should you use to analyse the data in Table 2? Justify your choice. (*3 marks*)
3. Work out the **calculated value** using the statistical test you identified in question 2. Explain whether the result is **significant** and how you arrived at this decision. (*4 marks*)
4. State the overall conclusion that can be drawn from the study. (*2 marks*)
5. Explain *one* way in which the **reliability** of the findings from this study could be assessed. (*3 marks*)

Revision summaries

The nervous system and the endocrine system

A major physiological system that regulates behaviour.

The nervous system

Central nervous system
Brain (cerebral cortex is outer layer), highly developed in humans.
Spinal cord connects brain to PNS, reflex actions.

Peripheral nervous system
Autonomic nervous system (sympathetic and parasympathetic).
Somatic nervous system (body).

The endocrine system

Glands and hormones
Hormones distributed in bloodstream.
Pituitary is the master gland.

Fight or flight
Sympathetic arousal:
pituitary → adrenal gland → adrenaline

Localisation of function in the brain

Different behaviours are controlled by specific areas of the brain.

The theory

Localisation versus holistic theory
Are brain functions in specific areas or across the whole brain?

Hemispheres of the brain
Brain (cerebrum) divided in half.
Each hemisphere controls the opposite side of the body = lateralisation.

Motor, somatosensory, visual and auditory centres
Each of the four lobes of the brain (frontal, parietal, occipital and temporal lobes) is linked to different functions.

Language centres of the brain
Broca's related to production (left frontal), Wernicke's related to understanding (left temporal).

Evaluation

Evidence from neurosurgery
Isolation (severing connections) of cingulate gyrus (cingulotomy) improves OCD in 30% of participants (Dougherty *et al.*).

Evidence from brain scans
Broca's and Wernicke's areas identified (Petersen *et al.*), semantic and episodic areas identified (Buckner and Petersen).
Counterpoint – learning in rats is holistic not localised (Lashley).

Language localisation questioned
Multiple pathways (e.g. right hemisphere and thalamus), not just Broca's and Wernicke's (Dick and Tremblay).

Evaluation extra: Case study evidence
Unique case studies supporting localisation (e.g. Phineas Gage), but may lack generalisability and be subjective.

Hemispheric lateralisation and split-brain research

Studying hemispheric deconnection.

Hemispheric lateralisation

Localisation and lateralisation
Some functions localised (e.g. vision), or localised and lateralised (e.g. language).

Left and right hemispheres
Language areas in LH (for most people).
LH is the analyser, RH is the synthesiser.
Motor areas are contralateral.
Visual areas are contralateral and ipsilateral, LVF of both eyes to RH and RVF to LH.
Same for auditory areas.

Evaluation

Lateralisation in the connected brain
Global elements processed by RH and finer detail by LH (Fink *et al.*).

One brain
Certain hemispheres dedicated to certain tasks but no dominant RH or LH (Nielsen *et al.*).

Evaluation extra: Lateralisation versus plasticity
Lateralisation enables multitasking e.g. chickens (Rogers *et al.*), but plasticity allows recovery of lost lateralised functions (Holland *et al.*).

Split-brain research

Procedure
Eleven participants, split-brain operation for epilepsy (deconnect hemispheres).

Findings
Object shown to RVF (LH), person describes object, shown to LVF (RH), says 'nothing there'.
Object shown to LVF (RH) – cannot name but can select item with left hand.
Pinup picture to LVF – participant giggles but reports nothing.

Conclusions
Lateralised brain, LH verbal and RH 'silent' but emotional.

Evaluation

Research support
Split-brain participants faster at some LH tasks (Luck *et al.*), normally slowed down by inferior RH (Kingstone *et al.*).

Generalisation issues
Epilepsy is a confounding variable when comparing participants to 'normal' controls.

Evaluation extra: Ethics
Operation not done for the study and participants gave informed consent, but may not have fully understood and participation was stressful.

Neurons and synaptic transmission

Another major physiological system that regulates behaviour.

Structure and function of neurons

Types of neuron
Sensory, relay and motor neurons.

Structure of a neuron
Cell body contains nucleus, has dendrites.
Axon covered in myelin sheath divided by nodes of Ranvier.

Electrical transmission
Positive charge leads to action potential.

Synaptic transmission

Synapse
Terminal buttons at synapse, presynaptic vesicles release neurotransmitter.

Neurotransmitters
Postsynaptic receptor site receives neurotransmitters from dendrites of adjoining neuron.
Specialist functions, e.g. acetylcholine for muscle contraction.

Excitation, inhibition and summation
Adrenaline is excitatory, serotonin is inhibitory.
Postsynaptic neuron triggered if sum of excitatory and inhibitory signals reaches threshold.

Psychotherapeutic drugs
SSRIs increase serotonin activity.

Plasticity and functional recovery of the brain after trauma

The brain's ability to change and adapt permits recovery from trauma.

Plasticity

Brain plasticity
Research suggests that neural connections can change or new connections can be formed.

Research into plasticity
Hippocampus in taxi drivers changes structure after learning The Knowledge (Maguire *et al.*).
Changes in hippocampus and the parietal cortex before and after exams (Draganski *et al.*).

Evaluation

Negative plasticity
Drug use may cause neural changes (Medina *et al.*).
Phantom limb syndrome due to reorganisation in somatosensory cortex (Ramachandran and Hirstein).

Age and plasticity
Plasticity reduces with age, though Bezzola *et al.* showed how golf training caused neural changes in over-40s.

Evaluation extra: Seasonal brain changes
Songbirds' SCN shrinks in spring and expands in autumn (Tramontin and Brenowitz).

Functional recovery

After brain trauma
Healthy brain areas take over lost functions after trauma, happens quickly.

What happens in the brain during recovery?
New synaptic connections, secondary pathways 'unmasked'.
- Axonal sprouting.
- Denervation supersensitivity.
- Recruitment of homologous brain areas.

Evaluation

Real-world application
Knowledge of axonal growth leads to e.g. constraint-induced movement therapy (massed practice with affected arm).

Cognitive reserve
40% recovery for people with 16 years' education, 10% for those with less than 12 years' education (Schneider *et al.*).

Evaluation extra: Small samples
100% recovery from stroke using stem cells (Banerjee) but small sample of five people.

Ways of studying the brain

Measuring brain activity and structure.

Scanning and other techniques

fMRI
Detects changes in blood flow to show active areas (where more oxygen consumed), 3D.

EEG
Measures brainwave patterns from thousands of neurons via electrodes.

ERP
Types of brainwave triggered by particular events filtered out from EEG recordings.

Post-mortems
Study of brain after death, in order to link brain areas to observed behaviour deficits.

Evaluation

fMRI
+ Risk-free, non-invasive and high spatial resolution.
– Expensive, poor temporal resolution.

EEG
+ Real-world uses (e.g. sleep stages, diagnosing epilepsy), high temporal resolution.
– Comes from 1000s of neurons, can't identify source.

ERP
+ More specific than EEG. Higher temporal resolution than fMRI.
– No standardised method, background 'noise' not easy to control.

Post-mortem
+ Early research (e.g. Broca).
– Causation an issue, consent issues (e.g. HM).

Biological rhythms

Circadian rhythms

Bodily rhythm that takes about 24 hours to complete.

The description

Biological rhythms
Controlled by internal body clocks (endogenous pacemakers) and external cues (exogenous zeitgebers).

The sleep/wake cycle
Governed by daylight and by biological clock (suprachiasmatic nucleus), gets light information from the eyes.

Siffre's cave study
His free-running rhythm extended slightly to 25 hours when deprived of daylight.

Other research
Support for exogenous zeitgebers entraining internal clock (Aschoff and Wever, bunker, natural rhythm longer).

Support for endogenous cues if difference too big (Folkard *et al.*, cave with 22-hour day).

Evaluation

Shift work
Reduced concentration at 6 am, more accidents (Boivin *et al.*) heart disease three times more likely (Knutsson).

Counterpoint – studies are correlational, effects may be due to disruptive social routines (Solomon).

Medical treatment
Timing of drugs (chronotherapeutics), aspirin more effective at night for heart attack (Bonten *et al.*).

Individual differences
Cycle lengths vary (13 to 65 hours, Czeisler *et al.*), 'larks' and 'owls' (Duffy *et al.*), generalisations may be meaningless.

Evaluation extra: Shifting the school day
Teenage chronotype means sleepy in morning, so shift school day but disruptive for others.

Infradian rhythms

Bodily rhythm that takes more than 24 hours to complete.

The description

The menstrual cycle
Oestrogen regulates ovulation, progesterone readies body for pregnancy (endogenous factors).

Synchronising the menstrual cycle
Menstrual cycles synchronised through pheromones, exogenous factor (Stern and McClintock).

Seasonal affective disorder
Form of depression triggered in the winter months and regulated by melatonin, a circannual rhythm.

Evaluation

Evolutionary basis
Synchronisation may have an adaptive function, leads to shared care for babies.

Methodological limitations
Many confounding variables not controlled, so synchronisation may occur by chance (Trevathan *et al.*).

Evaluation extra: Real-world application
Light therapy 80% effective for SAD (Sanassi), but relapse rate is 46% (Rohan *et al.*) compared to 27% for CBT.

Ultradian rhythms

Bodily rhythm that takes less than 24 hours to complete.

The description

Stages of sleep
5 stages that occur in a 90-minute cycle:

Stages 1 and 2: Alpha waves and sleep spindles.

Stages 3 and 4: Deep sleep, delta waves.

Stage 5: REM sleep, theta waves.

Evaluation

Improved understanding
SWS reduces with age, explains issues in old age e.g. reduced alertness (van Cauter *et al.*)

Individual differences
Differences found in duration of each sleep stage, particularly stages 3 and 4 (Tucker *et al.*).

Evaluation extra: The sleep lab
Lab studies of sleep control extraneous variables (e.g noise), but may not represent ordinary sleep patterns.

Endogenous pacemakers and exogenous zeitgebers

Rhythms are affected by body clocks and external cues.

Endogenous pacemakers and the sleep/wake cycle

The suprachiasmatic nucleus
SCN receives information about light from optic chiasm.

Animal studies and the SCN
Sleep/wake cycle disappeared when SCN destroyed (DeCoursey *et al.*).

SCN transplanted from mutant hamsters with 20-hour sleep cycle (Ralph *et al.*)

The pineal gland and melatonin
The SCN passes information to the pineal gland that controls melatonin.

Evaluation

Beyond the master clock
Other body clocks (peripheral oscillators) e.g. circadian rhythm of liver cells in mice altered but SCN unaffected (Damiola *et al.*).

Interactionist system
Research looks at pacemakers/zeitgebers in isolation, approach lacks validity,

Evaluation extra: Ethics
Mammals used to study sleep/wake cycle, but may lead to their death (e.g. Decoursey *et al.*'s chipmunks).

Exogenous zeitgebers and the sleep/wake cycle

Exogenous zeitgebers
'Time-givers' entrain free-running endogenous rhythms.

Light
Light shone on back of knees changed rhythm by up to three hours (Campbell and Murphy).

Social cues
Babies' rhythms and jet lag are entrained by bedtimes and mealtimes.

Evaluation

Environmental observations
EZs do not have same effect on people who live in darkness in summer and little light in winter (e.g. Inuit peoples in Arctic Circle).

Case study evidence
Man blind from birth with sleep/wake cycle, of 24.9 hours, could not adjust despite social cues e.g. mealtimes (Miles *et al.*).

Evaluation extra: Age-related insomnia
Poorer quality sleep as people age, may be natural changes in biological rhythms (Duffy *et al.*) or exogenous factors e.g. activity/exposure to natural light during day (Hood *et al.*).

Practice questions, answers and feedback

Question 1 Using an example, describe what is meant by 'localisation of function'. (*2 marks*)	
Morticia's answer *Localisation of function means that the parts of the brain all have a specific function such as the language area of the brain.*	Morticia has provided a brief response to both parts of the question.
Luke's answer *A localised function is where different areas of the brain are responsible for different behaviours or processes. One example of this is the visual area of the brain, which is in the occipital lobe and has the specific function of processing information from the eyes. If this area is damaged then no other part of the brain takes over.*	Luke's definition is clear and precise, and the example is well-explained.
Vladimir's answer *Areas of the brain have specific functions, for example the left side of the brain controls the right side of the body and is also related to language.*	Similar to Morticia's answer – the definition lacks detail, as does the example and so limited credit overall.

Question 2 A researcher conducted a meta-analysis of studies that investigated the length of the sleep/wake cycle. The researcher concluded that the average length of the sleep/wake cycle is between 24 and 25 hours. What is meant by a 'meta-analysis'? Refer to the research above in your answer. (*2 marks*)	
Morticia's answer *This is a study where the results from a number of other studies are analysed, for example in this case the researcher is looking at a number of studies that have investigated sleep.*	There is a brief definition of meta-analysis and reference to the question stem. However, the main aim of meta-analysis (to produce an overall conclusion) is not present.
Luke's answer *A researcher may combine a number of different studies as has been done here. The studies are all related to the same topic – in this case it is the length of the sleep-wake cycle. Then the researcher produces an overall conclusion.*	Luke has included the key element not present in Morticia's answer.
Vladimir's answer *Meta-analysis is the process of combining results from a number of studies on a particular topic (such as the sleep/wake cycle) to provide an overall view.*	Vladimir's answer is similar to Luke's and the notion of 'an overall view' is sufficient.

Question 3 Briefly discuss the implications of psychological research for the economy. Refer to the research in question 2 in your answer. (*4 marks*)	
Morticia's answer *Research on the sleep/wake cycle has implications for the economy because it is used to inform practices on shift work. One study by Boivin et al. found that mistakes are more likely to happen early in the morning for night shift workers.* *Sleep/wake research also has implications for drug treatments because it matters what time of day certain drugs are given for them to be most effective.* *Many other areas of psychological research have implications for the economy such as research related to attachment and memory and mental health. In all of these areas the government can save a lot of money by following advice given by psychologists about the things that cause certain negative behaviours. The research costs a lot to fund but it saves billions and that is why psychological research is good for the economy.*	This answer starts well though the link to shift workers' errors and the implications for the economy could be made more specific. The reference to drug treatment does not add anything substantial to the answer, as again the implications for the economy are not explained. The last paragraph also adds little to the answer. Morticia would have been better advised to select one example from the list offered and link this clearly to the economy.
Luke's answer *Research such as on the sleep/wake cycle can be applied to improving shift work to avoid expensive accidents. Psychological research has shown that people working at night lose concentration and make mistakes, which can be very costly for the government – both economically and also just in terms of a personal cost. Furthermore, research shows that shift work is related to poor health outcomes, which costs the national economy money. Therefore, if psychologists can recommend ways to reduce the health issues, it will benefit the economy.*	Notice how Luke's answer makes a clear link to economic gains and losses in the context of shift work which Morticia's response failed to do. There are two clear issues discussed here: the increased likelihood of mistakes and the negative impact on workers' health, which are clearly linked to the economy.
Vladimir's answer *Psychological research can provide great benefits to our economy. For example, work on sleep and circadian rhythms is important and so is research on mental health. Mental health problems cost us billions of pounds every year and are going to get worse because of increasing dementia. If psychologists can find ways to reduce cases of dementia or improve the costs of treatments to help people with dementia, that's our only way of avoiding bigger and bigger taxes.*	The link to sleep and circadian rhythms in Vladimir's answer is poorly realised and the economic implication is not discussed. The material on dementia is better in this respect though the reference to 'bigger and bigger taxes' is a little vague.

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

Question 4 Discuss how split-brain research has been used to investigate hemispheric lateralisation. (*16 marks*)

Morticia's answer

Lateralisation is not the same as localisation but they can be easily confused. Localisation refers to the fact that specific areas of the brain have specific functions, whereas lateralisation refers to the fact that the two parts of the brain control different things, in other words they have different functions.

These definitions are not really necessary for a question that focuses on 'research'.

The left half of the brain controls the right side of the body such as the right hand or right leg. The eyes are a bit different because each eye is divided into a left and right visual field and the left side of the brain processes the left visual field. The right side of the brain processes the right visual field coming from both eyes.

Again, this second paragraph is not addressing 'research' and there is also an error – the left side of the brain does not process the left visual field.

This was shown in a study by Roger Sperry. He used people who had their brains cut in half – called split-brain people. The operation was done because they had severe epilepsy and one way to treat this is to cut the connections between the two parts of the brain to stop the electrical signals going back and forth. This means that participants weren't deliberately harmed just for this operation which would have been unethical.

In paragraph 3 the answer begins to focus on evidence but unfortunately, although the description contains some accurate detail, it is muddled.

Sperry tested his participants a lot using quite a clever method so they could see images on a screen but couldn't see what their hands were doing. This meant he could show images on the left part of the screen which are then processed by the left hemisphere. If the participants were then asked to select the same object they couldn't because the left hemisphere doesn't control the left hand.

Paragraph 4 contains more description of evidence – this is not evaluation. Morticia does say 'using quite a clever method' which makes it slightly evaluative.

Another test that he used was to ask participants to say what they saw on the screen. They could only do this if the object was on the left side of the screen because that is linked to the left side of the brain where speech is located. Words were flashed for a very brief time otherwise people could move their heads and then both halves of the brain would see the words.

There is also an error in paragraph 4, repeated in paragraph 5 – objects projected to the left part of the screen are processed by the right hemisphere, not the left, and could be selected with the left hand (controlled by the right hemisphere).

There is an error in paragraph 5 – objects projected on the right, not the left, would be named as this information is processed by the left hemisphere.

To evaluate this research we can think about ethics. It was unethical because the operation was done anyway. It was a good study because it involved real people and the tasks were everyday tasks which could show what they could and couldn't do. However, there are issues with generalising because the participants may have brain damage from their epilepsy. Also the control group should have had epilepsy as well rather than being normal. **(406 words)**

The first two evaluative points in the final paragraph are not relevant. The last two are but could have been developed more.

Luke's answer

In the 1960s, Roger Sperry conducted research using split-brain participants to reveal how the brain is lateralised, i.e. how the two hemispheres perform different functions. Split-brain individuals undergo an operation (to treat severe epileptic seizures) where the corpus callosum and other structures which connect the two hemispheres are severed. This means that functionally the person has two separate brains.

Right from the beginning Luke's answer appears to be much more concentrated than Morticia's. The description of lateralisation is relevant here in the context of Sperry's research.

Sperry was thus able to demonstrate that speech was controlled in the left hemisphere and the right visual field was connected to the left hemisphere (and vice versa). He did this by briefly exposing images on a screen to the left and right visual fields. Participants could say what they saw in the right visual field but not the left visual field.

He also demonstrated this using touch. The participant's hands were placed under the screen and the participant couldn't see objects that could be touched. A participant could select an item with his left hand that was displayed to the left but not right visual field. This shows that the left hand is connected to the right hemisphere.

Paragraphs 2 and 3 provide accurate descriptive detail and a brief conclusion that could be developed.

This research was very important in establishing how the brain is lateralised. The research also suggested that the left side of the brain is more an analyser and the right hemisphere is a synthesiser.

In paragraph 4 the points are brief and could be further discussed, particularly the latter point.

However, this rather simplistic idea of left- and right-brained behaviour has been criticised as not representing brain function accurately. More recent research has shown that the brain is more plastic than once thought and each hemisphere can take on some of the functions of the other if required. In addition, in 'real' life the two hemispheres work together.

Paragraph 5 contains a very clear, fully elaborated discussion point, and the following paragraph is a relevant methodological critique.

His research was very well designed and objective and controlled, which meant the abilities of participants could be demonstrated. The key feature was ensuring that information was only received by one hemisphere, which was achieved using the short exposure time.

One issue with this research is ethics. On the one hand Sperry's participants were not deliberately harmed (the operation was not performed for the purpose of this study) and procedures were explained in advance to gain informed consent.

However, participants may not have understood they would be tested for many years. They may also have felt quite stressed by all the testing. We might consider the benefits of this research against the costs and conclude that the benefits were not sufficient to excuse the distress to participants. **(397 words)**

The answer ends with more evidence of discussion - an important skill for A level responses.

Overall there is an appropriate balance between description and discussion i.e. more of the latter.

Multiple-choice questions

The nervous system and the endocrine system

1. **Which division of the nervous system is divided into sympathetic and parasympathetic branches?**
   (a) The central nervous system.
   (b) The peripheral nervous system.
   (c) The somatic nervous system.
   (d) The autonomic nervous system.

2. **Which describes the somatic nervous system?**
   (a) Maintains homeostasis by regulating body temperature, heartbeat, etc.
   (b) Made up of the brain and the spinal cord.
   (c) Controls muscle movement.
   (d) Passes messages to and from the brain and connects nerves to the PNS.

3. **The master endocrine gland is the:**
   (a) Adrenal gland.
   (b) Pituitary gland.
   (c) Thyroid gland.
   (d) Hypothalamus.

4. **Which is *not* an action of the parasympathetic branch of the ANS?**
   (a) Inhibits digestion.
   (b) Contracts pupil.
   (c) Stimulates saliva production.
   (d) Decreases heart rate.

Neurons and synaptic transmission

1. **Which of the following carries messages from the PNS to the CNS?**
   (a) Sensory neuron.
   (b) Motor neuron.
   (c) Relay neuron.
   (d) Synaptic neuron.

2. **Which is *not* part of the basic structure of a neuron?**
   (a) Cell body.
   (b) Axon.
   (c) Effector.
   (d) Dendrite.

3. **Which of the following does *not* occur during synaptic transmission?**
   (a) The neuron is in a resting state.
   (b) An electrical impulse triggers the release of neurotransmitter.
   (c) Neurotransmitter diffuses across the synaptic gap.
   (d) The chemical message is converted back into an electrical impulse.

4. **The following describes what process?**
   'When a neuron is activated by a stimulus, the inside of the cell becomes positively charged for a split second. This creates an electrical impulse that travels down the axon towards the end of the neuron.'
   (a) Synaptic transmission.
   (b) Inhibitory response.
   (c) Presynaptic terminal.
   (d) Action potential.

Localisation of function in the brain

1. **The theory that all parts of the brain are involved in the processing of thought and action is called:**
   (a) Holistic theory.
   (b) Localisation theory.
   (c) Plasticity.
   (d) Lateralisation theory.

2. **Broca's area is located in the:**
   (a) Left parietal lobe.
   (b) Right occipital lobe.
   (c) Left frontal lobe.
   (d) Left temporal lobe.

3. **Damage to which area of the brain may result in a loss of control of fine movements?**
   (a) The somatosensory area.
   (b) The motor area.
   (c) The auditory area.
   (d) Wernicke's area.

4. **Most of the damage to Phineas Gage's brain was sustained in the:**
   (a) Frontal lobe.
   (b) Parietal lobe.
   (c) Temporal lobe.
   (d) Occipital lobe.

Hemispheric lateralisation and split-brain research

1. **The fact that language is controlled by the left hemisphere in most people is known as:**
   (a) Lateralisation.
   (b) Aphasia.
   (c) Holism.
   (d) Plasticity.

2. **If an object was shown to the left visual field of one of Sperry's participants, they would report:**
   (a) That they had seen the object.
   (b) That there was nothing there.
   (c) That they saw two objects.
   (d) That they saw a different object.

3. **The right hemisphere is often referred to as the:**
   (a) Synthesiser.
   (b) Analyser.
   (c) Language centre.
   (d) Visualiser.

4. **Roger Sperry conducted his study of split-brain individuals in:**
   (a) 1958.
   (b) 1968.
   (c) 1978.
   (d) 1988.

Plasticity and functional recovery in the brain after trauma

1. **The deleting of rarely used connections in the brain is known as:**
   (a) Synaptic priming.
   (b) Synaptic pluming.
   (c) Synaptic pruning.
   (d) Synaptic planning.

2. **In the Maguire *et al.* study of London taxi drivers which area was seen to have undergone learning-induced changes?**
   (a) Posterior hippocampus.
   (b) Anterior hypothalamus.
   (c) Interior gyrus.
   (d) Bacteria epiglottis.

3. **Which of the following refers to the activation of secondary neural pathways to carry out new functions?**
   (a) Revealing.
   (b) Unmasking.
   (c) Unearthing.
   (d) Renewing.

4. **The Bezzola *et al.* study saw 40 hours of training produce changes in neural representations of movement within which sport?**
   (a) Snooker.
   (b) Chess.
   (c) Golf.
   (d) Darts.

Ways of studying the brain

1. **A method of detecting changes in blood oxygenation and flow that occur as a result of neural activity best describes what?**
   (a) fMRI.
   (b) EEG.
   (c) ERP.
   (d) Post-mortem.

2. **Which of the following is most likely to measure 'global' (whole) brain activity rather than specific areas of activity/damage?**
   (a) fMRI.
   (b) EEG.
   (c) ERP.
   (d) Post-mortem.

3. **Which of the following uses a statistical averaging technique to remove extraneous scan data?**
   (a) fMRI.
   (b) EEG.
   (c) ERP.
   (d) Post-mortem.

4. **Which of the following describes a post-mortem examination?**
   (a) Removal of the frontal lobe.
   (b) Microscopic removal of brain cells.
   (c) Cutting the brain down the middle to separate hemispheres.
   (d) Examining a brain after death.

Biological rhythms: Circadian rhythms

1. Which of the following is an example of the circadian rhythm?
   (a) The menstrual cycle.
   (b) Seasonal affective disorder.
   (c) The sleep/wake cycle.
   (d) The stages of sleep.

2. In Siffre's cave study and Aschoff and Wever's bunker study, the biological clock was not influenced by exogenous zeitgebers (such as light). Within these studies, the biological clock is described as:
   (a) Free-wheeling.
   (b) Free-trading.
   (c) Free-flowing.
   (d) Free-running.

3. The number of participants whose sleep/wake cycle defaulted to 29 hours in the Aschoff and Wever study.
   (a) 0
   (b) 1.
   (c) 2.
   (d) 3.

4. Research into circadian rhythms has contributed to our understanding of chronotherapeutics. What is chronotherapeutics?
   (a) The study of the timing of drug dosing.
   (b) The study of how circadian and infradian rhythms interact.
   (c) The study of how endogenous pacemakers are detected by skin receptors.
   (d) The study of the effects of disruption of circadian rhythms (including shift work and jet lag).

Biological rhythms: Infradian and ultradian rhythms

1. The Stern and McClintock study investigated the influence of which chemicals?
   (a) Hormones.
   (b) Pheromones.
   (c) Phonemes.
   (d) Garden gnomes.

2. Rapid eye movement (REM) occurs in which phase of the sleep cycle?
   (a) Stages 1 and 2.
   (b) Stages 3 and 4.
   (c) Stage 5.
   (d) It is not part of the sleep cycle.

3. Melatonin is secreted by the:
   (a) Adrenal gland.
   (b) Thyroid gland.
   (c) Pituitary gland.
   (d) Pineal gland.

4. Which pattern of brainwave activity is most associated with deep, slow wave sleep?
   (a) Alpha waves.
   (b) Beta waves.
   (c) Delta waves.
   (d) Theta waves.

Endogenous pacemakers and exogenous zeitgebers

1. The SCN is located within which part of the brain?
   (a) Hypothalamus.
   (b) Hippocampus.
   (c) Amygdala.
   (d) Corpus callosum.

2. The mutant hamsters in the Ralph *et al.* study were bred to have circadian rhythms of how long?
   (a) 28 days.
   (b) 28 hours.
   (c) 24 hours.
   (d) 20 hours.

3. Campbell and Murphy's participants had light shone:
   (a) On the back of their necks.
   (b) On the soles of their feet.
   (c) On the backs of their knees.
   (d) Up their noses.

4. The word 'zeitgeber' means:
   (a) Light source.
   (b) Rhythm source.
   (c) Clock-giver.
   (d) Time-giver.

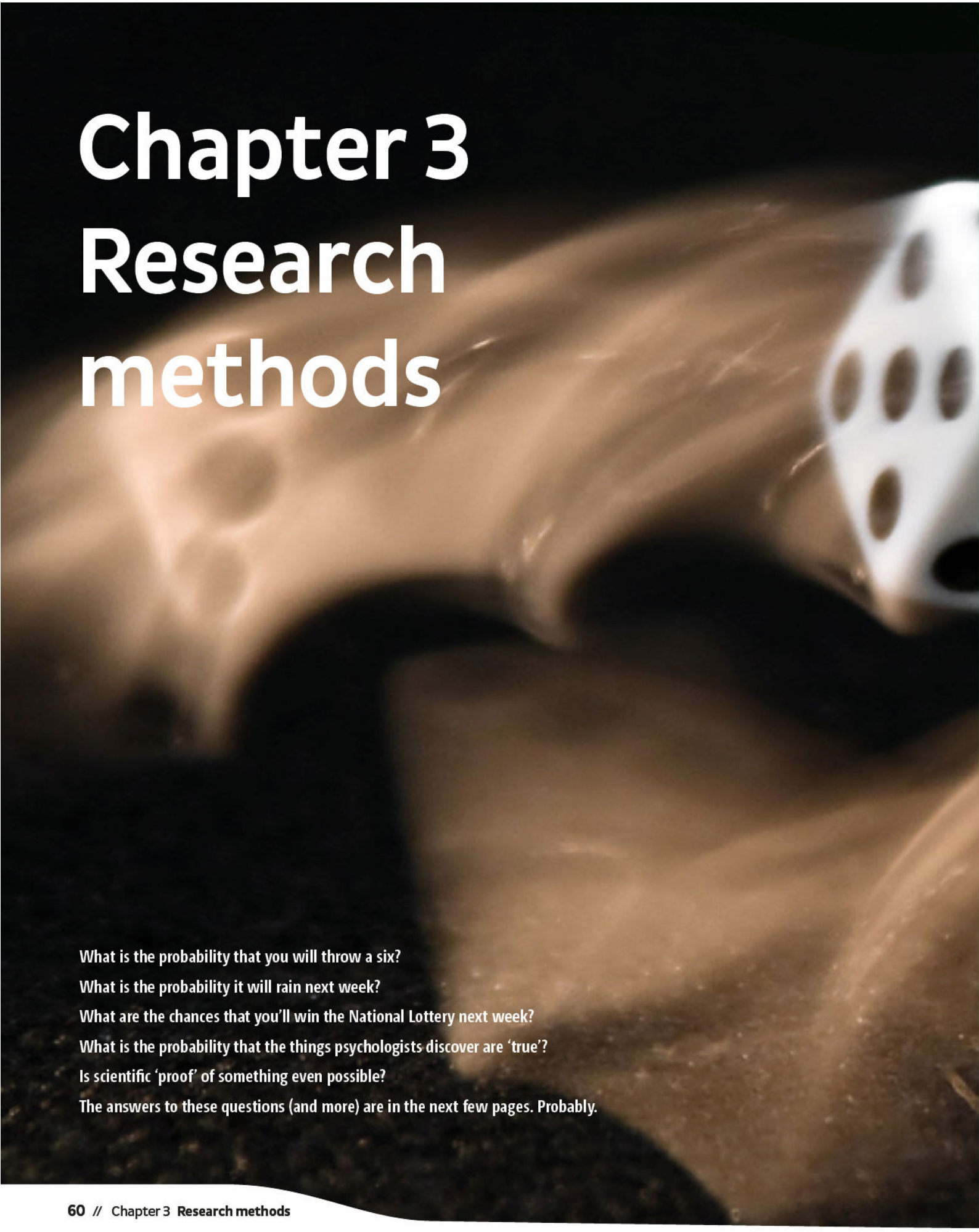


The person who came up with the name 'brain' for the brain must have used their brain to come up with it. So what that means, if you think about it, is that the brain named itself. Spooky.

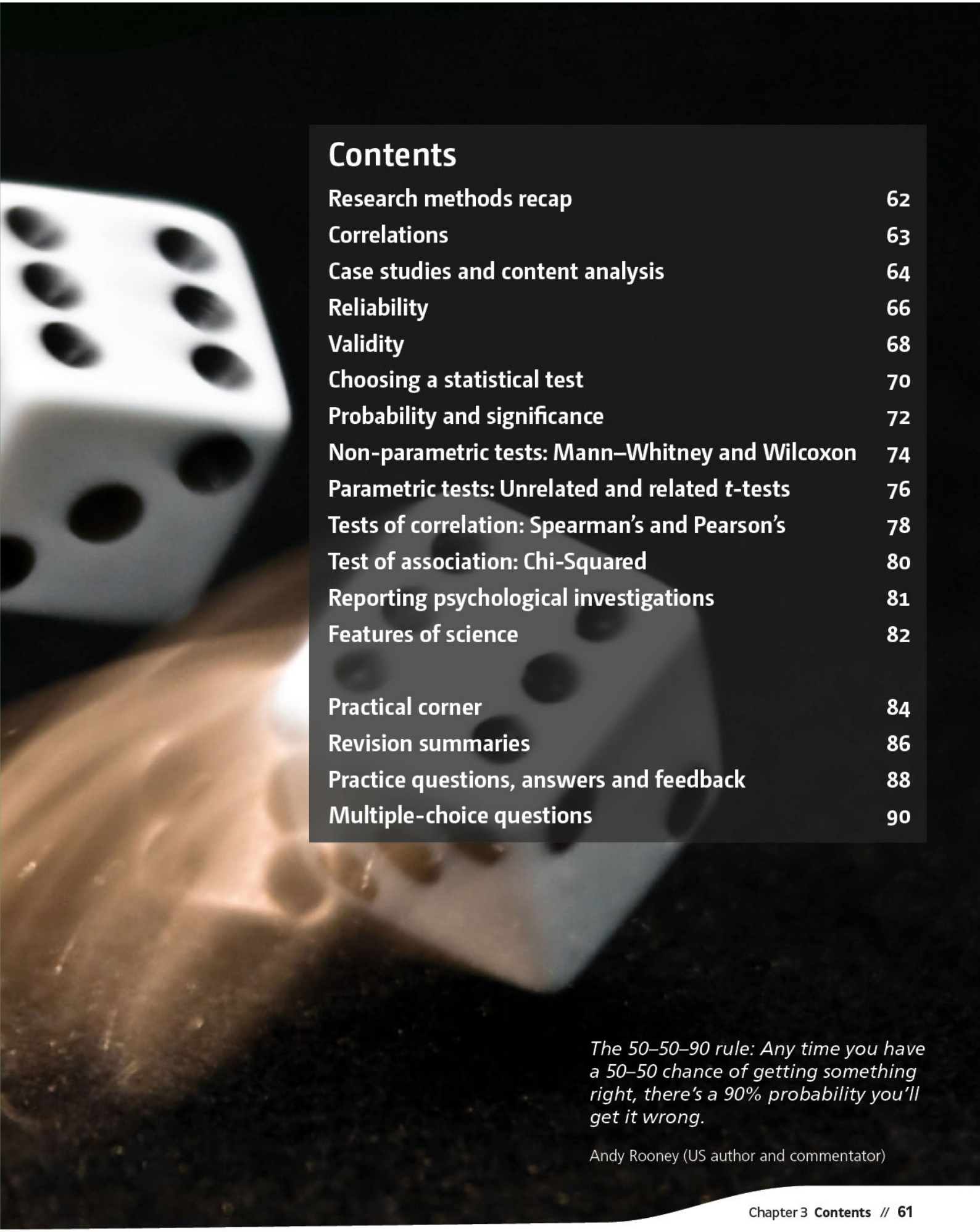
MCQ answers

The nervous system and the endocrine system 1D, 2C, 3B, 4A
Neurons and synaptic transmission 1A, 2C, 3A, 4D
Localisation of function in the brain 1A, 2C, 3B, 4A
Hemispheric lateralisation and split-brain research 1A, 2B, 3A, 4B
Plasticity and functional recovery of the brain after trauma 1C, 2A, 3B, 4C
Ways of studying the brain 1A, 2B, 3C, 4D
Biological rhythms: Circadian rhythms 1C, 2D, 3B, 4A
Biological rhythms: Infradian and ultradian rhythms 1B, 2C, 3D, 4C
Endogenous pacemakers and exogenous zeitgebers 1A, 2D, 3C, 4D

Chapter 3 Research methods



What is the probability that you will throw a six?
What is the probability it will rain next week?
What are the chances that you'll win the National Lottery next week?
What is the probability that the things psychologists discover are 'true'?
Is scientific 'proof' of something even possible?
The answers to these questions (and more) are in the next few pages. Probably.



Contents

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The 50–50–90 rule: Any time you have a 50–50 chance of getting something right, there's a 90% probability you'll get it wrong.

Andy Rooney (US author and commentator)

Research methods recap

The specification says...

At AS level students should demonstrate knowledge and understanding of the following research methods, scientific processes and techniques of data handling and analysis, be familiar with their use and be aware of their strengths and limitations. At A level students should also demonstrate knowledge and understanding of inferential testing and be familar with the use of inferential tests.

Welcome back to Research methods! Included on this spread is a summary of all the Research methods content that you need to know. On the right is a recap of what you have already covered in Year 1. Below is a breakdown of the content for this year that is A level only.

Key term

Research methods The processes by which information or data is collected usually for the purpose of testing a hypothesis and/or a theory.

The methods bit

Overall, at least 25–30% of the marks in assessments for AS/A level Psychology will be based on assessment of research methods. Although 50% of Paper 2 at A level will assess research methods, it could also be assessed in any other topic on any other paper!

Research methods – still to come ...

A level only

Tick off topics as you complete them.

- Analysis and interpretation of correlation, including correlation coefficients. ☐
- Case studies. Content analysis and coding. Thematic analysis. ☐
- Reliability across all methods of investigation. Ways of assessing reliability: test–retest and inter-observer; improving reliability. ☐
- Types of validity across all methods of investigation: face validity, concurrent validity, ecological validity and temporal validity. Assessment of validity. Improving validity. ☐
- Factors affecting the choice of statistical test, including level of measurement (nominal, ordinal and interval) and experimental design. ☐
- Probability and significance: use of statistical tables and critical values in interpretation of significance; Type I and Type II errors. ☐
- When to use the following tests: Spearman's *rho*, Pearson's *r*, Wilcoxon, Mann–Whitney, related *t*-test, unrelated *t*-test and Chi-Squared test. ☐
- Reporting psychological investigations. Sections of a scientific report: abstract, introduction, method, results, discussion and referencing. ☐
- Features of science: objectivity and the empirical method; replicability and falsifiability; theory construction and hypothesis testing; paradigms and paradigm shifts. ☐

At the end of each chapter in this book (including this one) you will find suggestions for practical investigations. You should carry out as many of these as you can to support your understanding of research methods.

Research methods – the story so far ...

AS and Year 1 Specification content

Tick off what you already know and would feel confident answering questions on in the exam. Revisit concepts if necessary.

- Aims: stating aims, the differences between aims and hypotheses. ☐
- Hypotheses: directional and non-directional. ☐
- Variables: manipulation and control of variables, including independent, dependent, extraneous, confounding; operationalisation of variables.
  Control: random allocation and counterbalancing, randomisation and standardisation. Demand characteristics and investigator effects. ☐
- Experimental method. Types of experiment, laboratory and field experiments; natural and quasi-experiments. Experimental designs: repeated measures, independent groups, matched pairs. ☐
- Sampling: the difference between population and sample; sampling techniques including: random, systematic, stratified, opportunity and volunteer; implications of sampling techniques, including bias and generalisation. ☐
- Ethics, including the role of the British Psychological Society's code of ethics; ethical issues in the design and conduct of psychological studies; dealing with ethical issues in research. ☐
- Pilot studies and the aims of piloting. ☐
- Observational techniques. Types of observation: naturalistic and controlled observation; covert and overt observation; participant and non-participant observation. Observational design: behavioural categories; event sampling; time sampling. ☐
- Self-report techniques. Questionnaires; interviews, structured and unstructured. Questionnaire construction, including use of open and closed questions; design of interviews. ☐
- Correlations. Analysis of the relationship between co-variables. The difference between correlations and experiments. Positive, negative and zero correlations. ☐
- Quantitative and qualitative data; the distinction between qualitative and quantitative data collection techniques. Primary and secondary data, including meta-analysis. ☐
- Descriptive statistics: measures of central tendency – mean, median, mode; calculation of mean, median and mode; measures of dispersion: range and standard deviation; calculation of range. ☐
- Presentation and display of quantitative data: graphs, tables, scattergrams, bar charts, histograms. Distributions: normal and skewed distributions; characteristics of normal and skewed distributions. ☐
- Mathematical content – calculation of percentages, converting a percentage to a decimal, decimal places, converting a decimal to a fraction, using ratios, estimates, significant figures, standard form, order of magnitude calculations, mathematical symbols, substituting values. ☐
- Introduction to statistical testing; the sign test; probability; when to use the sign test; calculation of the sign test. ☐
- The role of peer review in the scientific process. ☐
- The implications of psychological research for the economy. ☐

Analysis and interpretation of correlations

Correlations and correlation coefficients

The term **correlation** refers to a mathematical technique which measures the relationship/association between two *continuous* variables (properly called **co-variables**). Such relationships are plotted on a **scattergram** where each axis represents one of the variables investigated. We shall also see, later in this chapter, how correlations/associations may be analysed using **statistical tests**.

You will study two statistical tests of correlation (see pages 78–79) each of which, when calculated, produces a numerical value somewhere between –1 and +1 known as the **correlation coefficient.** This value tells us the *strength* and *direction* of the relationship between the two variables.

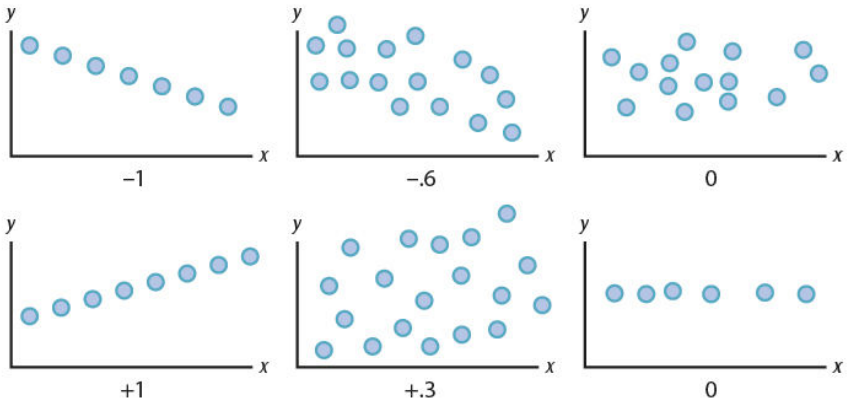
Working out what a coefficient means

As can be seen below, a value of +1 represents a *perfect* **positive correlation**, and a value of –1, a *perfect* **negative correlation**.

The closer the coefficient is to +1 or –1, the *stronger* the relationship between the co-variables is. The closer to zero, the *weaker* the relationship is. +.50 is as strong a relationship as –.50, the sign just indicates the direction.

However, it should be noted that coefficients that appear to indicate weak correlations can still be **statistically significant** – it depends on the size of the data set.

Scattergrams showing various correlation coefficients.



Note that both graphs on the right represent zero correlation even though the distribution of scores is quite different.

The specification says...

Analysis and interpretation of correlation, including correlation coefficients.

Correlation is not new to you – you learned about it in Year 1 of the course. Here we will focus on the analysis and interpretation of correlations and correlation coefficients. All correlations can be represented by a number somewhere between –1 and +1. What this number means is explained here.

Key terms

Correlation A mathematical technique in which a researcher investigates an association between two variables, called co-variables.

Correlation coefficient A number between –1 and +1 that represents the direction and strength of a relationship between co-variables.

Apply it Methods

Interpretation of correlation coefficients

Questions

1. What sort of relationship is suggested by the following coefficients? (*5 marks*)
   a) –.40
   b) +.90
   c) +.13
   d) –.76
   e) 0
2. What are the strengths *and* limitations of using correlations in psychological research? (*6 marks*)

Study tip

At A level you need to be aware of the difference between **descriptive statistics** and **inferential statistics**.

Descriptive statistics refers to things like graphs, tables and summary statistics (such as measures of central tendency and measures of dispersion). These are used to identify trends and analyse sets of data.

Inferential statistics refers to the use of **statistical tests** which tell researchers whether the differences or relationships they have found are statistically significant or not. This helps decide which **hypothesis** to accept and which to reject. A **correlation coefficient** is calculated using a statistical test and, as such, is an inferential statistic.



Look out for this feature:

Apply it Methods

in every chapter so you can test your research methods skills …

Check it

1. Explain what is meant by 'correlation coefficient'. *[2 marks]*
2. Sketch a graph to represent a negative correlation between 'number of people in a room' and 'amount of personal space'. *[2 marks]*
3. Using an example, explain what is meant by 'correlation'. *[2 marks]*

Case studies and content analysis

The specification says...

Case studies. Content analysis and coding. Thematic analysis.

Here, we look at two ways of investigating human behaviour not considered in Year 1 – case studies and content analysis.

Case studies allow a detailed insight into a single individual, group or institution. It is a method often favoured by researchers who adopt an idiographic approach to the study of human behaviour.

We came across types of observational research in Year 1. Content analysis is a form of observation which analyses the communication that people produce. Anything from a single email or text to a series of films or television programmes may be an appropriate object of study.

Key terms

Case studies An in-depth investigation, description and analysis of a single individual, group, institution or event.

Content analysis A research technique that enables the indirect study of behaviour by examining communications that people produce, for example, in texts, emails, TV, film and other media.

Coding The stage of a content analysis in which the communication to be studied is analysed by identifying each instance of the chosen categories (which may be words, sentences, phrases, etc.).

Thematic analysis An inductive and qualitative approach to analysis that involves identifying implicit or explicit ideas within the data. Themes will often emerge once the data has been coded.

Apply it
Methods

Gynotikolobomassophobia

Patient X is a *gynotikolobomassophobic* – he has a morbid fear of women's ear lobes. His fear is so extreme that Patient X finds it impossible to talk to women in social situations (unless their ears are covered) and spends much of his time alone in his home.

A psychologist carrying out a case study of Patient X has conducted detailed interviews with him about his childhood. Patient X has also been encouraged to keep a diary as a record of his everyday experiences. The psychologist has concluded that Patient X's phobia may have been the result of childhood trauma.

Questions

1. What are the main features of a case study? Refer to Patient X as part of your answer. (*4 marks*)
2. Briefly discuss the strengths *and* limitations of the case study approach. Again, refer to Patient X as part of your discussion. (*6 marks*)
3. What **ethical issues** are associated with the case study approach? (*4 marks*)

Case studies

To study a 'case' in psychology is to provide a detailed and in-depth analysis of an individual, group, institution or event. **Case studies** often involve analysis of *unusual* individuals or events, such as a person with a rare disorder or the sequence of events that led to the 2011 London riots (see below). However, case studies may also concentrate on more 'typical' cases, such as an elderly person's recollections of their childhood.

Conducting a case study usually – though not exclusively – involves the production of **qualitative data**. Researchers may construct a **case history** of the individual concerned, perhaps using interviews, observations, questionnaires, or a combination of all of these. It is even possible that the person may be subject to experimental or psychological testing to assess what they are (or are not) capable of, and this may produce **quantitative data**.

Case studies tend to take place over a long period of time (**longitudinal**) and may involve gathering additional data from family and friends of the individual as well as the person themselves.

Content analysis

Content analysis is a type of **observational** research in which people are studied *indirectly* via the communications they have produced. The forms of communication that may be subject to content analysis are wide-ranging and may include spoken interaction (such as a conversation or speech/presentation), written forms (such as texts or emails) or broader examples from the media (such as books, magazines, TV programmes or films). The aim is to summarise and describe this communication in a systematic way so overall conclusions can be drawn.

Coding and quantitative data

Coding is the initial stage of content analysis. Some data sets to be analysed may be extremely large (such as the transcripts of several dozen lengthy interviews) and so there is a need to *categorise* this information into meaningful units. This may involve simply counting up the number of times a particular word or phrase appears in the text to produce a form of quantitative data. For instance, newspaper reports may be analysed for the number of times derogatory terms for people with mental health issues are used, such as 'crazy' or 'mad'. Another example would be TV adverts which may be examined to see how often men and women are depicted in 'professional roles' (at work) or 'familial roles' (at home) (which is similar to a study carried out by Adrian Furnham and Elena Farragher (2000) – see page 164 for more details).

Thematic analysis and qualitative data

Thematic analysis is a form of content analysis but the outcome is qualitative. The main process involves the identification of themes. A *theme* in content analysis refers to any idea, explicit or implicit, that is *recurrent* – in other words, which keeps 'cropping up' as part of the communication being studied. These are likely to be more descriptive than the coding units described above. For instance, people with mental health issues may be misrepresented in newspapers as 'a threat to the well-being of our children' or as 'a drain on the resources of the NHS'. Such themes may then be developed into broader categories, such as 'control', 'stereotyping' or 'treatment' of people with mental health issues.

Once the researcher is satisfied that the themes they have developed cover most aspects of the data they are analysing, they may collect a new set of data to test the **validity** of the themes and categories. Assuming these explain the new data adequately, the researcher will write up the final report, typically using direct quotes from the data to illustrate each theme.



A scene from the London riots in 2011. Psychologists were interested in this one-off event and what it could tell us about crowd behaviour.

Evaluation

Strengths

Case studies are able to offer rich, detailed insights that may shed light on very unusual and atypical forms of behaviour. This may be preferred to the more 'superficial' forms of data that might be collected from, say, an experiment or questionnaire.

As well as this, case studies may contribute to our understanding of 'typical' functioning. For example, the case of HM (Year 1 book, chapter 2) was significant as it demonstrated typical memory processing – the existence of separate stores in STM and LTM.

Case studies may generate hypotheses for future study and one solitary, contradictory instance may lead to the revision of an entire theory – 'the single pebble that starts an avalanche'.

Limitations

Generalisation of findings is obviously an issue when dealing with such small sample sizes. Furthermore, the information that makes it into the final report is based on the subjective selection and interpretation of the researcher. Add to this the fact that personal accounts from the participants and their family and friends may be prone to inaccuracy and memory decay, especially if childhood stories are being told. This means that evidence from case studies begins to look a little low in validity.

Evaluation

Strengths

Content analysis is useful in that it can circumnavigate (a posh word for 'get around') many of the **ethical issues** normally associated with psychological research. Much of the material that an analyst might want to study, such as TV adverts, films, personal ads in the newspaper or on the internet, etc., may already exist within the public domain. Thus there are no issues with obtaining permission. Such communications have the benefit of being high in **external validity**, and may access data of a sensitive nature provided the 'authors' consent to its use.

We have also seen that content analysis is flexible in the sense that it may produce both qualitative and quantitative data depending on the aims of the research.

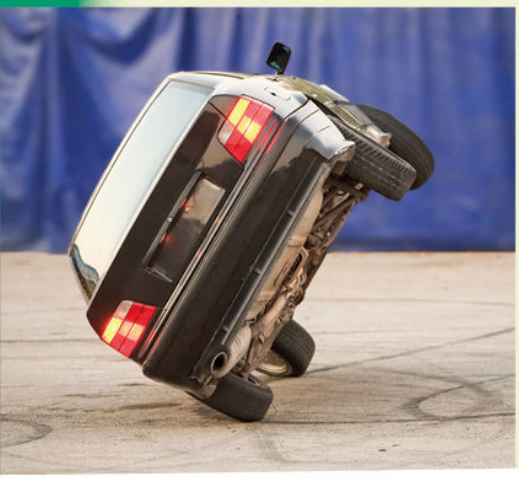
Limitations

People tend to be studied *indirectly* as part of content analysis so the communications they produce are usually analysed *outside* of the context within which it occurred. There is a danger (similar to case studies above) that the researcher may attribute opinions and motivations to the speaker or writer that were not intended originally.

To be fair, many modern analysts are clear about how their own biases and preconceptions influence the research process, and often make reference to these as part of their final report (see the idea of **reflexivity** on page 95). However, content analysis may still suffer from a lack of objectivity, especially when more descriptive forms of thematic analysis are employed.

Apply it
Methods

Analysing driving behaviour



A researcher was interested to know whether there is a gender difference in driving behaviour and decided to conduct a content analysis of film clips of male and female drivers.

Question

Explain how the researcher might have carried out content analysis to analyse the film clips of driver behaviour. (*4 marks*)

Apply it
Methods

Toilet humour

Several studies in psychology have involved qualitative analysis of the content of *latrinalia* – that is, the graffiti often seen scribbled on toilet walls.

A study by Nicholas Matthews *et al.* (2012) involved the analysis of 1,200 instances of graffiti gathered from toilet walls in US bars. Graffiti was coded according to a number of distinct categories: *sexual references, socio-political (religion, politics, race, etc.), entertainment (music, TV), physical presence (the writing of one's name for instance), love/romance* and *scatological (for example, reference to defecation).* Graffiti was also classified in terms of whether it was *interactive* (a response to other graffiti) or *independent* (a stand-alone comment).

Matthews *et al.* found that males composed significantly more sexual and physical presence graffiti, whilst females authored more romantic and interactive graffiti.

Question

Explain how this investigation illustrates some of the strengths and limitations of content analysis. (*6 marks*)



Bathroom banter … but how might a content analysis of toilet wall graffiti be conducted?

Apply it
Methods

How to conduct a content analysis

Content analysis, like any observational research, involves design decisions about the following:

- *Sampling method* – how material should be sampled, e.g. time sampling or event sampling.
- *Recording data* – should data be transcribed or recorded, for instance, using video? Should data be collected by an individual researcher or within a team? (See the next spread for a discussion of the importance of inter-rater reliability when conducting content analysis.)
- *Analysing and representing data* – how should material be categorised or coded in order to summarise it? Should the number of times something is mentioned be calculated (quantitative analysis) or described using themes (qualitative analysis)?

Question

Explain how, in designing their study of latrinalia, Matthews *et al.* might have addressed each of the design decisions outlined above. (*6 marks*)

Check it

1. Briefly evaluate the use of case studies in psychology. *[4 marks]*
2. Explain **one** limitation of using content analysis to analyse data. *[2 marks]*
3. Explain the processes involved in conducting a content analysis. *[4 marks]*

Reliability

The specification says...

> Reliability across all methods of investigation. Ways of assessing reliability: test–retest and inter-observer; improving reliability.

In everyday life, when we describe someone as 'reliable', we mean that they are *dependable*; that we know to expect the same level of behaviour from them every single time. A reliable individual, for instance, is always punctual and never late or always late and never punctual. A reliable car is one that rarely breaks down and maintains the same level of performance over time.

Psychology's version of reliability is pretty similar: to what extent are the tests, scales, surveys or observations or experiments that psychologists use consistent? Any measurement should produce the same data every time it is made, otherwise it is not reliable.

Key terms

Reliability Refers to how consistent a measuring device is – and this includes psychological tests or observations which assess behaviour.

Test–retest reliability A method of assessing the reliability of a questionnaire or psychological test by assessing the same person on two separate occasions. This shows to what extent the test (or other measure) produces the same answers i.e. is consistent or reliable.

Inter-observer reliability The extent to which there is agreement between two or more observers involved in observations of a behaviour. This is measured by correlating the observations of two or more observers. A general rule is that if (total number of agreements) / (total number of observations) > +.80, the data has high inter-observer reliability.

Reliability: it ain't great unless it's ...

+.8

Statisticians don't write correlations with a leading zero and in reality they always write it as two decimal places but +.80 kinda spoils the rhyme!

Practical activity on page 84

Reliability

Reliability is a measure of *consistency*. In general terms, if a particular measurement is made twice and produces the same result then that measurement is described as being reliable.

A ruler should find the same measurement for a particular object (let's say a chair) every time that object is measured – unless the ruler is broken or, in the words of Phoebe Buffay (*Friends*, Season 5, Episode 3), 'all the rulers are wrong'. If there is a change in the measurement over time, then we would attribute that change to the object rather than the ruler (someone may have sat on the chair and squashed it).

Similarly, if a test or measure in psychology assessed some 'thing' on a particular day (let's say intelligence), then we would expect the same result on a different day, unless the 'thing' itself had changed. Maybe we tested a different person with a different IQ or the same person's IQ went up a little (or possibly down after watching *Friends* ...).

Unlike rulers, psychologists tend not to measure concrete things, like length or height, but are more interested in abstract concepts such as attitudes, aggression, memory and IQ. Can researchers have the same confidence in their **psychological tests**, **observations** and **questionnaires** as most of us – apart from Phoebe that is – have in a ruler?

Ways of assessing reliability

Test–retest

Psychologists have devised ways of assessing whether their measuring tools are reliable. The most straightforward way of checking reliability is the **test–retest** method. This simply involves administering the same test or questionnaire to the same person (or people) on different occasions. If the test or questionnaire is reliable then the results obtained should be the same, or at least very similar, each time they are administered. Note that this method is most commonly used with questionnaires and psychological tests (such as IQ tests) but can also be applied to **interviews**.

There must be sufficient time between test and retest to ensure, say, that the participant/respondent cannot recall their answers to the questions to a survey but not so long that their attitudes, opinions or abilities may have changed. In the case of a questionnaire or test, the two sets of scores would be **correlated** to make sure they are similar (see below). If the correlation turns out to be **significant** (and positive) then the reliability of the measuring instrument is assumed to be good.

Inter-observer reliability

The phrase '*beauty is in the eye of the beholder*' suggests that everyone has their own unique way of seeing the world. This issue is relevant to **observational research** as one observer's interpretation of events may differ widely from someone else's – introducing **subjectivity**, **bias** and unreliability into the data collection process.

The recommendation is that would-be observers should not 'go it alone' but instead conduct their observations in teams of at least two. However, **inter-observer reliability** must be established. This may involve a small-scale trial run (a **pilot study**) of the observation in order to check that observers are applying **behavioural categories** in the same way, or a comparison may be reported at the end of a study. Observers obviously need to watch the same event, or sequence of events, but record their data independently. As with the test–retest method, the data collected by the two observers should be correlated to assess its reliability. Note that similar methods would apply to other forms of observation, such as **content analysis** (though this would be referred to as **inter-rater reliability**) as well as **interviews** if they are to be conducted by different people (known as **inter-interviewer reliability** – which is a bit of a mouthful).

Measuring reliability

Reliability is measured using a correlational analysis. In test–retest and inter-observer reliability, the two sets of scores are correlated. The **correlation coefficient** should exceed +.80 for reliability.

Apply it Methods

The correlation 'test'

When assessing test–retest reliability or inter-observer reliability two sets of data will be correlated to see whether they match. The degree of correlation can be measured statistically using a statistical test of correlation such as Spearman's *rho* (see page 78).

Once the test has been performed on the two sets of data, a correlation coefficient will be calculated. The value of the coefficient must be +.80 or above for data to be judged reliable. Any figure lower than this and researchers must 'go back to the drawing board' so to speak and redesign their test or questionnaire – or reassess their observational categories.

Question

What would a correlation coefficient of +.95 between the data of two observers suggest? (*2 marks*)

Improving reliability

Questionnaires

As we have seen, the reliability of questionnaires over time should be measured using the test–retest method. Comparing two sets of data should produce a correlation that exceeds +.80 (see facing page). A questionnaire that produces low test–retest reliability may require some of the items to be 'deselected' or rewritten. For example, if some questions are complex or ambiguous, they may be interpreted differently by the same person on different occasions. One solution might be to replace some of the open questions (where there may be more room for [mis]interpretation) with closed, fixed-choice alternatives which may be less ambiguous.

Interviews

For interviews, probably the best way of ensuring reliability is to use the same interviewer each time. If this is not possible or practical, all interviewers must be properly trained so, for example, one particular interviewer is not asking questions that are too **leading** or ambiguous. This is more easily avoided in **structured interviews** where the interviewer's behaviour is more controlled by the fixed questions. Interviews that are unstructured and more 'free-flowing' are less likely to be reliable.

Observations

The reliability of observations can be improved by making sure that behavioural categories have been properly **operationalised**, and that they are measurable and self-evident (for instance, the category 'pushing' is much less open to interpretation than 'aggression'). Categories should not overlap ('hugging' and 'cuddling' for instance) and all possible behaviours should be covered on the checklist.

If categories are not operationalised well, or are overlapping or absent, different observers have to make their own judgements of what to record where and may well end up with differing and inconsistent records.

If reliability is low, then observers may need further training in using the behavioural categories and/or may wish to discuss their decisions with each other so they can apply their categories more consistently.

Experiments

In an experiment it is the procedures that are the focus of reliability. In order to compare the performance of different participants (as well as comparing the results from different studies) the procedures must be the same (consistent) every time. Therefore in terms of reliability an experimenter is concerned about **standardised procedures**.

Apply it Methods

Inter-observer reliability amongst *Friends*

Two psychology students decided to see whether they could establish inter-observer reliability between themselves. They watched five episodes of *Friends* and recorded the different types of 'humour' within the programme. Before the study, they agreed on five observational categories of humour: sarcastic, slapstick, sexual/relationship-based, play on words and teasing.

Questions

1. Invent some data for their observations and put the data in a table. (*3 marks*)
2. The students compared their data and found a correlation coefficient of +.64. What does this indicate in terms of the reliability of the two students' data? (*2 marks*)
3. What should the students do next to improve the reliability of their observations? (*4 marks*)

Apply it Methods

Personality testing

Personality tests in psychology take several forms and are often used in forensic settings to support clinical diagnosis (see the *Eysenck Personality Questionnaire, EPQ,* on page 330). A more controversial measure of personality is the *Rorschach 'inkblot' test.*

People are presented with a series of ambiguous inkblot images and are required to 'say what they see' in the pictures. The aim is to reveal the respondent's unconscious motivations and wishes as interpreted by the researcher or therapist. One criticism of the inkblot method is that one 'scorer' may not necessarily produce the same interpretation as another.



Questions

1. The inkblot test has been criticised by many as an 'unreliable' measure of personality. Why do you think this is? (*2 marks*)
2. Explain *one* way of assessing the reliability of the Rorschach inkblot test. (*3 marks*)

Q: What's the same as half an apple pie?

A: The other half!

Hilarious. But with halves of apple pie at least, we can assume reliability.



Apply it Methods

Ghostly goings on – Part 1

A psychologist wanted to investigate the extent to which people believe in ghosts and devised a questionnaire as a way of assessing this. There were 20 items on the questionnaire in total.

Questions

1. Outline *one* way in which the psychologist could have assessed the **reliability** of the questionnaire. (*3 marks*)

Following the questionnaire, the psychologist selected a sample of 10 respondents who had completed the questionnaire and then observed their behaviour overnight in a house that was supposedly haunted. Working alongside another observer, the psychologist recorded evidence of a fear reaction to a number of stimuli including a creaking door, a gust of wind and a squeaky floorboard.

2. State *three* behavioural categories that could be used to measure the variable 'fear'. (*3 marks*)
3. Explain *one* way in which the researchers could have assessed the reliability of their observations. (*3 marks*)

Check it

1. Outline what is meant by 'reliability' in psychological research. *[2 marks]*
2. Explain **two** ways of assessing reliability. *[6 marks]*
3. Explain **one or more** ways of improving reliability. *[4 marks]*

Validity

The specification says...

> Types of validity across all methods of investigation: face validity, concurrent validity, ecological validity and temporal validity. Assessment of validity. Improving validity.

Consistency within psychological research is one thing – but it is not the *only* thing. Demonstrating the same (or similar) findings on a number of different occasions is all very well – but what if the thing we are demonstrating each time turns out to be meaningless? Or not what we thought we were demonstrating? This is the issue of validity in psychological research – whether a study, investigation or investigative tool is a legitimate or genuine measure.

Key terms

Validity The extent to which an observed effect is genuine – does it measure what it was supposed to measure, and can it be generalised beyond the research setting within which it was found?

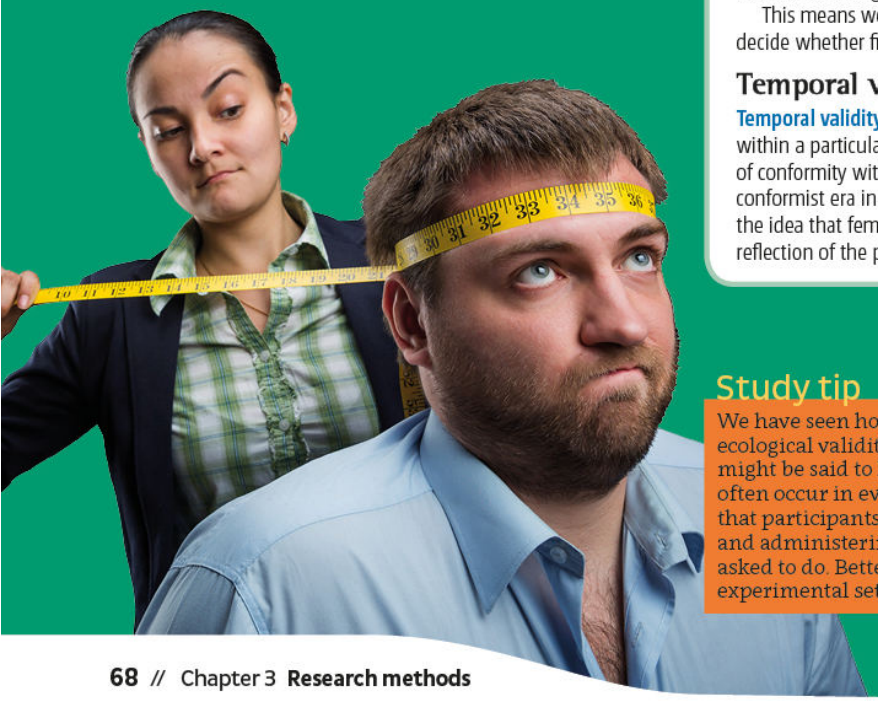
Face validity A basic form of validity in which a measure is scrutinised to determine whether it appears to measure what it is supposed to measure – for instance, does a test of anxiety look like it measures anxiety?

Concurrent validity The extent to which a psychological measure relates to an existing similar measure.

Ecological validity The extent to which findings from a research study can be generalised to other settings and situations. A form of external validity.

Temporal validity The extent to which findings from a research study can be generalised to other historical times and eras. A form of external validity.

Whilst measuring your head produces a **reliable** result – in that it is the same every time (we hope) – as a measure of intelligence it is not **valid**.



Types of validity

Validity refers to whether a **psychological test**, **observation**, **experiment**, etc., produces a result that is legitimate. In other words, whether the observed effect is genuine and represents what is actually 'out there' in the real world. This includes whether the researcher has managed to measure what they intended to measure (**internal validity**). It also refers to the extent to which findings can be generalised beyond the research setting in which they were found (**external validity**).

It is possible for studies and measures to produce **reliable** data that is not valid. For instance, a broken set of scales may give a consistent reading of someone's weight which is always 7 lbs more than their actual weight. In this example, the scales are reliable but the weight that is reported is not 'true' so the measurement lacks validity. In psychology, a test that claims to measure intelligence (or IQ) may not measure something 'true' about intelligence – it may simply measure a person's familiarity with IQ tests!

Internal validity

Internal validity refers to whether the effects observed in an experiment are due to the manipulation of the **independent variable** and not some other factor. One major threat to the internal validity of a study is if participants respond to **demand characteristics** and act in a way that they think is expected. For example, some commentators have questioned the internal validity of Milgram's obedience study claiming that participants were 'playing along' with the experimental situation and did not really believe they were administering shocks, i.e. they responded to the *demands* of the situation.

External validity

Meanwhile, external validity relates more to factors outside of the investigation, such as generalising to other settings, other populations of people and other eras.

Ecological validity is a type of external validity – it concerns generalising the findings from a study to other settings – most particular to 'everyday life' as that is what psychologists are interested in studying.

The concept of ecological validity is often misunderstood because people think it is about the naturalness of a study – a more natural setting should mean the findings from the study can be generalised to everyday life (high ecological validity). A lab is an artificial setting and therefore people think that the results of lab research should have low ecological validity because people don't behave naturally in a lab.

However, this isn't quite true. If the task that is used to measure the **dependent variable** in an experiment is not 'like everyday life' (i.e. low **mundane realism**) this has lower ecological validity. For example, a researcher might give people a list of words to remember to assess memory and could do this in a shopping mall – this would be a field study. However, in this case the *setting* doesn't make the findings more 'realistic'. The fact that we are using a word list makes the findings of the study lack ecological validity.

This means we must look at all sorts of aspects of the research set-up in order to decide whether findings can be generalised beyond the particular research setting.

Temporal validity

Temporal validity is the issue of whether findings from a particular study, or concepts within a particular theory, hold true over time. Critics have suggested that high rates of conformity within the original Asch experiments were a product of a particularly conformist era in recent American history (the 1950s). Some of Freud's concepts, such as the idea that females experience **penis envy**, are deemed to be outdated, sexist and a reflection of the patriarchal Victorian society within which he lived.

Study tip

We have seen how the debate about whether findings from lab studies have ecological validity is often oversimplified. Both Asch's and Milgram's studies might be said to have high ecological validity as they involved processes that often occur in everyday life (conformity and obedience). However, the tasks that participants had to complete within these studies (comparing line lengths and administering electric shocks) were not things people would normally be asked to do. Better to say then that the studies had low **mundane realism** as the experimental set-up did not mirror everyday life.

Practical activity on page 84

Ways of assessing validity

One basic form of validity is **face validity**, whether a test, scale or measure appears 'on the face of it' to measure what it is supposed to measure. This can be determined by simply 'eyeballing' the measuring instrument or by passing it to an expert to check.

The **concurrent validity** of a particular test or scale is demonstrated when the results obtained are very close to, or match, those obtained on another recognised and well-established test. A new intelligence test, for instance, may be administered to a group of participants and the IQ scores they achieve may be compared with their performance on a well-established test (such as the *Stanford-Binet test*). Close agreement between the two sets of data would indicate that the new test has high concurrent validity – and close agreement is indicated if the correlation between the two sets of scores exceeds +.80.

Improving validity

Experiments

In **experimental** research, validity is improved in many ways. For example, using a **control group** means that a researcher is better able to assess whether changes in the dependent variable were due to the effect of the **independent variable**. For instance, in a study looking at the effectiveness of a therapy, a control group who did not receive therapy means that the researcher can have greater confidence that improvement was due to effects of the therapy rather than, say, the passage of time.

Experimenters may also **standardise** procedures to minimise the impact of **participant reactivity** and **investigator effects** on the validity of the outcome. The use of **single-blind** and **double-blind procedures** is designed to achieve the same aim. You may remember that in a single-blind procedure participants are not made aware of the aims of a study until they have taken part (to reduce the effect of **demand characteristics** on their behaviour). In a double-blind study, a third party conducts the investigation without knowing its main purpose (which reduces both demand characteristics and investigator effects and thus improves validity).

Questionnaires

Many **questionnaires** and **psychological tests** incorporate a **lie scale** within the questions in order to assess the consistency of a respondent's response and to control for the effects of **social desirability bias**. Validity may be further enhanced by assuring respondents that all data submitted will remain **anonymous**.

Observations

Observational research may produce findings that have high ecological validity as there may be minimal intervention by the researcher. This is especially the case if the observer remains undetected, as in **covert observations**, meaning that the behaviour of those observed is likely to be natural and authentic.

In addition, **behavioural categories** that are too broad, overlapping or ambiguous may have a negative impact on the validity of the data collected.

Qualitative research

Qualitative methods of research are usually thought of as having higher ecological validity than more **quantitative**, less interpretative methods of research. This is because the depth and detail associated with **case studies** and **interviews**, for instance, is better able to reflect a participant's reality.

However, a researcher may still have to demonstrate the **interpretive validity** of their conclusions. This is the extent to which the researcher's interpretation of events matches that of their participants. This can be demonstrated through such things as the *coherence* of the researcher's narrative and the inclusion of *direct quotes* from participants within the report. Validity is further enhanced through **triangulation** – the use of a number of different sources as evidence, for example, data compiled through interviews with friends and family, personal diaries, observations, etc.

Apply it Methods – Ghostly goings on – Part 2

A psychologist wanted to investigate the extent to which people believe in ghosts and devised a questionnaire as a way of assessing this. There were 20 questions in total.

Questions

1. Explain what is meant by 'validity'. Refer to the investigation above in your answer. (*3 marks*)
2. Explain *two* ways in which the psychologist could have improved the validity of the investigation above. (*4 marks*)

Apply it Methods – Threats to validity

The following are threats to validity that we came across in Research methods in Year 1 – though some will apply to particular forms of research more than others.

Identify each from the definitions below:

1. Any variable, other than the IV, that may have an effect on the DV if it is not controlled. These are essentially nuisance variables that do not vary systematically with the IV. (*1 mark*)
2. Any variable, other than the IV, that may have affected the DV so we cannot be sure of the true source of changes to the DV. They vary systematically with the IV. (*1 mark*)
3. Any cue from the researcher or the research situation that may be interpreted by participants as revealing the true purpose of the investigation. (*1 mark*)
4. Any effect of the researcher's behaviour (conscious or unconscious) on the research outcome. This may include everything from the design of the study to the selection of, and interaction with, participants. *(1 mark)*
5. A question which, because of the way it is phrased, suggests a certain answer that may influence the response of the participant. (*1 mark*)

Did you get what you were aiming for? One of the concerns for psychologists trying to improve the validity of their research studies is that their expectations may influence the behaviour of their participants.



When assessing concurrent validity, the ***correlation coefficient*** between the two sets of scores must exceed +.80. Now where have we seen that before? It ain't great unless it's ...

+.8

Check it

1. Outline what is meant by 'concurrent validity' in psychological research. *[2 marks]*
2. Explain the difference between ecological validity and temporal validity. *[2 marks]*
3. Explain **two** ways of assessing validity. *[6 marks]*
4. Explain **one or more** ways of improving validity. *[4 marks]*

Choosing a statistical test

The specification says...

Factors affecting the choice of statistical test, including level of measurement (nominal, ordinal and interval) and experimental design. When to use the following tests: Spearman's *rho*, Pearson's *r*, Wilcoxon, Mann–Whitney, related *t*-test, unrelated *t*-test and Chi-Squared test.

Quantitative (numerical) data can be summarised using descriptive statistics which include measures of central tendency, measures of dispersion, graphs and charts.

Although these are useful, they do not tell us whether the differences or correlations psychologists find are statistically significant (explained on the next spread), this is the job of statistical tests.

Key terms

Statistical tests (also called inferential tests) Used in psychology to determine whether a significant difference or correlation exists (and consequently, whether the null hypothesis should be rejected or retained).

Sign test A statistical test for a difference in scores between related items (e.g. the same participant tested twice). Data should be nominal level or better.

Levels of measurement Quantitative data can be classified into types or levels of measurement, such as nominal, ordinal and interval.

Spearman's *rho* A test for a correlation when data is at least ordinal level.

Pearson's *r* A parametric test for a correlation when data is at interval level.

Wilcoxon A test for a difference between two sets of scores. Data should be at least ordinal level using a related design (repeated measures).

Mann–Whitney A test for a difference between two sets of scores. Data should be at least ordinal level using an unrelated design (independent groups).

Related *t*-test A parametric test for a difference between two sets of scores. Data must be interval level with a related design, i.e. repeated measures or matched pairs.

Unrelated *t*-test A parametric test for a difference between two sets of scores. Data must be interval level with an unrelated design, i.e. independent groups.

Chi-Squared A test for an association (difference or correlation) between two variables or conditions. Data should be nominal level using an unrelated (independent) design.

Choosing a statistical test

Statistical testing

In Year 1 you had a brief introduction to the concept of **statistical testing** using the example of the **sign test**. You will recall that a statistical test is used to determine whether a difference or an association/**correlation** found in a particular investigation is statistically **significant** – that is, more than could have occurred by **chance**. The outcome of this has implications for whether we accept or reject the **null hypothesis** – but we shall return to this on the next spread. For now, we need to consider which statistical test is used under what circumstances. There are three factors used to decide this:

1. Whether a researcher is looking for a *difference* or *correlation*.
2. In the case of a difference, what **experimental design** is being used.
3. The **level of measurement**.

These criteria are summarised in the table below.

Decision 1. Difference or correlation?

The first thing to consider when deciding which statistical test to use relates to the aim or purpose of the investigation – namely, is the researcher looking for a difference or correlation. This should be obvious from the wording of the **hypothesis**. In this context, 'correlation' can include investigations that are looking for an *association* (see the **Chi-Squared** test on page 80).

Decision 2. Experimental design?

(Note that if the investigation is looking for a correlation, rather than a difference, experimental design is not an issue.)

You should remember from Year 1 that there are three types of experimental design: **independent groups**, **repeated measures** and **matched pairs**. The last two of these are referred to as **related designs**. In a repeated measures design, the same participants are used in all conditions of the experiment. In a matched pairs design, participants in each condition are not the same but have been 'matched' on some variable that is important for the investigation which makes them 'related'. For this reason, both designs are classed as *related*.

As participants in each condition of an independent groups design are different, this design is **unrelated**. Thus, the researcher chooses from two alternatives here: *related* or *unrelated*.

Choosing a statistical test.

	Test of difference		Test of association or correlation
	Unrelated design	Related design	
Nominal data	Chi-Squared	**Sign test**	Chi-Squared
Ordinal data	**Mann–Whitney**	**Wilcoxon**	**Spearman's *rho***
Interval data	**Unrelated *t*-test**	**Related *t*-test**	**Pearson's *r***

Note that Chi-Squared is a test of both difference and association/correlation. Data items must be unrelated.

Also note that the three tests on the blue background are parametric tests (the two forms of *t*-test and Pearson's *r*).

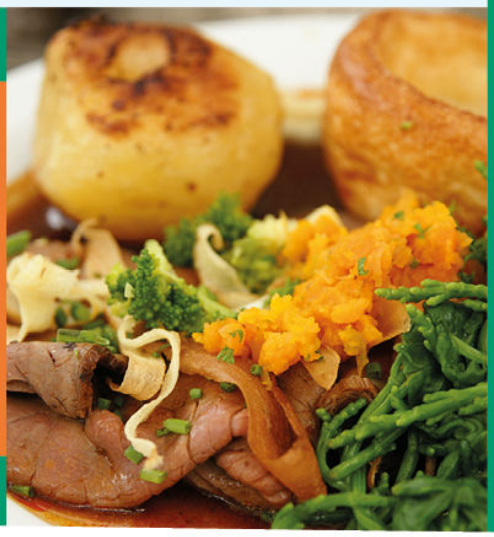
Study tip

You will need to memorise the table above so you know which test to use under what circumstances. If you are memorising the table exactly as it looks here, the following mnemonic might help you remember the sequence of the tests (the first letter in each of the words in the sentence corresponds to the first letter of the stats test):

Carrots **S**hould **C**ome

Mashed **W**ith **S**wede

Under **R**oast **P**otatoes





Decision 3. Levels of measurement?

Quantitative data can be divided into different **levels of measurement** and this is the third factor influencing the choice of statistical test. There are three levels of measurement: **nominal**, **ordinal** and **interval**.

Nominal data Data is represented in the form of categories – hence nominal data is sometimes referred to as **categorical data**. For example, you can ask everyone in your class if they like psychology. People who say 'yes' are in one group and people who say 'no' are in the other group.

Nominal data is **discrete** in that one item can only appear in one of the categories. For example, if you asked people to name their favourite football team their vote only appears in one category (nominal data can have more than two groups).

Ordinal data Data is ordered in some way. An example of ordinal data would be asking everyone in your class to rate how much they like psychology on a scale of 1 to 10 where 1 is 'do not like psychology at all' and 10 is 'absolutely love psychology'.

Ordinal data does not have equal intervals between each unit (unlike in interval data, below). For instance, in our example it would not make sense to say that someone who rated psychology an 8 enjoys it twice as much as someone who gave it a 4.

Ordinal data also lacks precision because it is based on subjective opinion rather than objective measures. In our example, what constitutes a '4' or an '8' for the people doing the rating may be quite different. In the case of an IQ test the questions are derived from a view of what constitutes intelligence rather than any universal measurement. Questionnaires, psychological tests and so on do not measure something 'real' (i.e. they are not observable physical entities whereas, for example, reaction times and height are 'real'). Questionnaires etc. measure psychological constructs.

For these reasons, ordinal data is sometimes referred to as 'unsafe' data because it lacks precision. Due to its unsafe nature, ordinal data is not used as part of statistical testing. Instead, raw scores are converted to ranks (i.e. 1st, 2nd, 3rd, etc) and it is the ranks – not the scores – that are used in the calculation (see pages 74–75 and 78 for tests using ordinal data).

Interval data In contrast to ordinal data above, interval data is based on numerical scales that include units of equal, precisely defined size. In this sense it is 'better' than ordinal data because more detail is preserved (and ordinal is 'better' than nominal level).

Think of the kinds of things you would use to take measurements with in maths or other sciences, such as a stopwatch, a thermometer or weighing scales. These are public scales of measurement that produce data based on accepted units of measurement (time, temperature, weight). So, for instance, if we recorded how long it took each of our students to complete a written recall test in psychology, we would have collected interval data. Interval data is the most precise and sophisticated form of data in psychology and is a necessary criterion for the use of **parametric tests** (see right).

Table showing levels of measurement and their relation to the appropriate measures of central tendency and measures of dispersion.

Level of measurement	Measure of central tendency	Measure of dispersion
Nominal	Mode	n/a
Ordinal	Median	Range
Interval	Mean	Standard deviation

Note that the range and standard deviation cannot be calculated on nominal data as such data is in the form of frequencies. It is not appropriate to use the mean or the standard deviation for ordinal data as the intervals between the units of measurement are not of equal size.

Apply it
Methods

Which level of measurement?

Identify whether the following would produce data at the nominal, ordinal or interval level.

1. Time taken to sort cards into categories. (*1 mark*)
2. People's choice of the *Sun*, *The Times* or the *Guardian*. (*1 mark*)
3. Participants' sense of self-worth, estimated on a scale of 1–10. (*1 mark*)
4. Judges in a dancing competition giving marks for style and presentation. (*1 mark*)
5. Participants' reaction to aversive stimuli measured using a heart rate monitor. (*1 mark*)
6. A set of medical records classifying patients as either chronic, acute or 'not yet classified'. (*1 mark*)

Study tip

Some of the data produced in psychology is quite difficult to classify. For example, should we treat 'number of words recalled' in a memory test as interval or ordinal data?

Strictly speaking, this would only be interval data if the words are all of equal difficulty (so the units of measurement are all equivalent). This would be very difficult to achieve as some words will always be more memorable than others! For this reason, it is probably 'safer' to treat number of words recalled as ordinal data and rank the set of scores accordingly.

But you should always provide your reasoning when deciding which level of measurement is appropriate.

Apply it
Methods

Parametric tests

The related *t*-test, unrelated *t*-test and Pearson's *r* are collectively known as parametric tests. Parametric tests are more powerful and robust than other tests. If a researcher is able to use a parametric test they will do so, as these tests may be able to detect significance within some data sets that non-parametric tests cannot.

There are three criteria that must be met in order to use a parametric test:

1. Data must be interval level – parametric tests use the actual scores rather than ranked data.
2. The data should be drawn from a population which would be expected to show a normal distribution for the variable being measured. Variables that would produce a skewed distribution are not appropriate for parametric tests.
3. There should be *homogeneity of variance* – the set of scores in each condition should have similar dispersion or spread. One way of determining variance is by comparing the standard deviations in each condition. If they are similar, a parametric test may be used. In a related design it is generally assumed that the two groups of scores have a similar spread.

Question

If a researcher compared two related sets of data and was looking to see if they were different, why would it be preferable to use a related *t*-test instead of a Wilcoxon? (*2 marks*)

Check it

1. Identify **and** explain the difference between **two** levels of measurement in psychological research. *[4 marks]*
2. Identify **three** factors that influence the choice of statistical test. *[3 marks]*
3. Explain **two** requirements that need to be met to use an unrelated *t*-test. *[4 marks]*

Probability and significance

The specification says...

Probability and significance: use of statistical tables and critical values in interpretation of significance; Type I and Type II errors.

All statistical tests end with a number – the calculated value. This number is crucial in determining whether the researcher has found a result that is statistically significant, and consequently, whether they should accept the alternative or null hypothesis.

To understand how statistical tests work requires an understanding of the related concepts of probability and significance.

Key terms

Probability A measure of the likelihood that a particular event will occur where 0 indicates statistical impossibility and 1 statistical certainty.

Significance A statistical term that tells us how sure we are that a difference or correlation exists. A 'significant' result means that the researcher can reject the null hypothesis.

Critical value When testing a hypothesis, the numerical boundary or cut-off point between acceptance and rejection of the null hypothesis.

Type I error The incorrect rejection of a true null hypothesis (a false positive).

Type II error The failure to reject a false null hypothesis (a false negative).



What is the probability of two people in a football match sharing the same birthday? There are 23 people on the pitch (including the referee). The chance that any two people will have the same birthday is 1 in 365. If all 23 people shook hands with each other, there would be 253 handshakes. This equates to the number of pairs of people who could potentially share the same birthday. 253/365 = 0.69. The probability of two people in a football match sharing the same birthday is 69% i.e. well over half. Most people are surprised by how high this is!

Probability and significance

The null hypothesis

Researchers begin their investigations by writing a **hypothesis**. This may be **directional** or **non-directional** depending how confident the researcher is in the outcome of the investigation. Here is an example of a hypothesis (you may remember it from the Year 1 book):

After drinking 300 ml of SpeedUpp, *participants say more words in the next five minutes than participants who drink 300 ml of water.*

This is sometimes referred to as an **alternative hypothesis** (or H_1 for short) because it is alternative to the **null hypothesis** (H_0). The null hypothesis states there is 'no difference' between the conditions:

There is no difference in the number of words spoken in five minutes between participants who drink 300 ml of SpeedUpp *and participants who drink 300 ml of water.*

The **statistical test** determines which hypothesis is 'true' and thus whether we accept or reject the null hypothesis.

Levels of significance and probability

Actually, 'true' is probably the wrong word. Statistical tests work on the basis of **probability** rather than certainty. All statistical tests employ a **significance level** – the point at which the researcher can claim to have discovered a large enough difference or correlation within the data to claim an effect has been found. In other words, the point at which the researcher can reject the null hypothesis and accept the alternative hypothesis.

The usual level of **significance** *in psychology is 0.05 (or 5%).*

This is properly written as $p \leq 0.05$ (where p stands for probability).

This means the probability that the observed effect (the result) occurred when there is no effect in the population is equal to or less than 5%. This means that even when a researcher claims to have found a significant difference/correlation, there is still up to 5% chance that it isn't true for the target population from which the sample was drawn.

Psychologists can never be 100% certain about a particular result as they have not tested all members of the population under all possible circumstances! For this reason, psychologists have settled upon a conventional level of probability where they are prepared to accept that results may have occurred by chance.

Study tip

People often refer to the concepts of probability and chance in everyday life. We might surmise that the chance of rain is around '50/50', that our favourite football team has a 'good chance' of winning on Saturday or that we have 'no chance' of winning the National Lottery (the actual statistical probability is about 1 in 14 million).

In psychological research, the 5% significance level ensures that, in the case of a significant result, there is equal to or less than a 5% chance that this happened if the null hypothesis was true (i.e. there is no real effect in the population). However, in these circumstances, it is not correct to state that we can be '95% certain that the result did not occur by chance'. If you think about it, the phrase '95% certain' is a contradiction in terms – we can only ever be 100% certain of anything – and statistical testing deals with probabilities not certainties!

Apply it Methods

Drug testing

A researcher is testing the effectiveness of a new drug that relieves the symptoms of anxiety disorder – *Anxocalm*. The researcher is comparing two groups of people with anxiety – one group will complete a course of Anxocalm and the other group will be given a placebo. There is a possibility that the drug may cause mild side effects in those who take it (such as a headache and nausea). For this reason, the researcher can only test the drug once on human participants.

The researcher has decided to use the 1% level when testing for significance.

Question

Explain why the researcher has decided to use the 1% level of significance on this occasion. (*2 marks*)

Use of statistical tables

Calculated and critical values

Once a statistical test has been calculated, the result is a *number* – the **calculated value** (sometimes called the 'observed value'). To check for statistical significance, the calculated value must be compared with a **critical value** – a number that tells us whether or not we can reject the null hypothesis and accept the alternative hypothesis.

Each statistical test has its own **table of critical values**, developed by statisticians. These tables look like very complicated bingo cards (see example on the next spread). For some statistical tests, the calculated value must be equal to or greater than the critical value, for other tests, the calculated value must be equal to or less than the critical value (see the 'Rule of R' below).

Using tables of critical values

How does the researcher know which critical value to use? There are three criteria:

- **One-tailed** or **two-tailed test**? You use a one-tailed test if your hypothesis was directional and a two-tailed test for a non-directional hypothesis. Probability levels *double* when two-tailed tests are being used as they are a more *conservative* prediction.
- **The number of participants in the study**. This usually appears as the *N* value on the table. For some tests **degrees of freedom** (*df*) are calculated instead.
- The **level of significance** (or *p* value). As discussed, the 0.05 level of significance is the standard level in psychological research.

Levels of significance

As discussed on the facing page, the 0.05 level of significance is the standard level in psychological research. Occasionally, a more stringent level of significance may be used (such as 0.01) in studies where they may be a *human cost* – such as drug trials – or 'one-off' studies that could not, for practical reasons, be repeated in future. In all research, if there is a *large* difference between the calculated and critical values – in the preferred direction – the researcher will check more stringent levels, as the *lower* the *p* value is, the more statistically significant the result.

Type I and Type II errors

Due to the fact that researchers can never be 100% certain that they have found statistical significance, it is possible (*usually up to 5% possible*) that the wrong hypothesis may be accepted.

A **Type I error** is when the null hypothesis is rejected and the alternative hypothesis is accepted when it should have been the other way round because, in reality, the null hypothesis is 'true'. This is often referred to as an optimistic error or false positive as the researcher claims to have found a significant difference or correlation when one does not exist.

A **Type II error** is the reverse of the above – when the null hypothesis is accepted but it should have been the alternative hypothesis because, in reality, the alternative hypothesis is true. This is a pessimistic error or 'false negative'.

We are more likely to make a Type I error if the significance level is too lenient (too high) e.g. 0.1 or 10% rather than 5%. A Type II error is more likely if the significance level is too stringent (too low) e.g. 0.01 or 1%, as potentially significant values may be missed. Psychologists favour the 5% level of significance as it best balances the risk of making a Type I or Type II error.



Apply it Methods – Pregnancy tests

Pregnancy tests are not 100% reliable so women who suspect they are pregnant are advised to take more than one test in order to make sure.

Question

If the result says you are not pregnant – in what way could this be a Type II error? (*2 marks*)

Study tip

If you are testing a directional hypothesis you may find that your calculated value is significant – but there is a further issue. Are your results in the direction you predicted? If they are not, then you must accept the null hypothesis even though the calculated value is significant. Before you ask – you can't just change the original hypothesis!

In fact, in such cases this should be obvious when looking at the data and a researcher would not carry out any statistical testing.

Study tip

As suggested above, it is OK to check more stringent levels of significance as long as the critical value at the 5% level has been checked first to establish significance. However, higher levels of significance, such as 10% should be disregarded. At these levels, the null hypothesis cannot be rejected – though the hypothesis may be worth pursuing and refining the methodology.

Apply it Methods – The rule of R

Some statistical tests require the calculated value to be *equal to or more than* the critical value for statistical significance. For other tests, the calculated value must be *equal to or less than* the critical value.

The *rule of R* can help with this. Those statistical tests with a letter 'R' in their name are those where the calculated value must be equal to or *more* than the critical value (note that there is also an 'r' in 'more' which is a further clue!).

Questions

1. List the statistical tests with a letter R in their name. (*1 mark*)
2. List the statistical tests without a letter R. (*1 mark*)

Check it

1. Explain what is meant by a Type I **and** Type II error. Outline the difference between these two errors. *[4 marks]*
2. Define what is meant by the 'critical value' in statistical testing. *[2 marks]*
3. What is the accepted level of significance in psychological research? *[1 mark]*

Non-parametric tests: Mann–Whitney and Wilcoxon

The specification says...

> Students should demonstrate knowledge and understanding of inferential testing and be familiar with the use of inferential tests.

An 'inferential test' is another term for a statistical test. In Year 1 of the course you learned to use a statistical test of difference – the sign test. This spread includes two further statistical tests that are used to determine whether two samples are significantly different: Mann–Whitney and Wilcoxon. In each case a worked example is given so you can understand how the test is calculated and how significance is determined.

Note that, in an independent groups design, the numbers of participants in each group may be different as is the case here – Group A has 10 participants ($N_A = 10$) and Group B has 8 participants ($N_B = 8$).

Table 3 Critical values of U for a two-tailed test, $p \leq 0.05$.

N_A / N_B	2	3	4	5	6	7	8	9	10
2							0	0	0
3				0	1	1	2	2	3
4			0	1	2	3	4	4	5
5		0	1	2	3	5	6	7	8
6		1	2	3	5	6	8	10	11
7		1	3	5	6	8	10	12	14
8	0	2	4	6	8	10	13	15	17
9	0	2	4	7	10	12	15	17	20
10	0	3	5	8	11	14	17	20	23
11	0	3	6	9	13	16	19	23	26
12	1	4	7	11	14	18	22	26	29
13	1	4	8	12	16	20	24	28	33
14	1	5	9	13	17	22	26	31	36

Calculated value of U must be EQUAL TO or LESS THAN the critical value in this table for significance to be shown.

Apply it
Methods

What does it all mean?

The investigation described on the right found a significant difference at $p \leq 0.05$.

Questions

1. Explain what is meant by the phrase 'a significant difference was found at $p \leq 0.05$'. (*2 marks*)
2. What conclusion can be drawn from the investigation described? (*2 marks*)

Mann–Whitney: A worked example

Why Mann–Whitney?

In this worked example we are looking for a difference between two groups of employers based on their rating of whether a candidate (who had **schizophrenia**) was suitable for a job interview. There are two **independent groups** of employers, which means the design is unrelated. Finally, the level of measurement is **ordinal** as data is based on scores on an 'unsafe' scale (subjective ratings of interview suitability) which are converted to ranks for the purposes of the test.

The aim

A study of the effects of labelling in schizophrenia was conducted to see if there is a difference in someone's perceived 'employability' based on whether they had been diagnosed with schizophrenia in the past. Eighteen employers were shown an application form and ask to rate the candidate in terms of how likely they would be called for an interview, on a scale of 1–20 (where 1 = definitely would not be interviewed and 20 = definitely would be interviewed).

All employers saw the same application form, the only difference was that for employers in Group A the form included the phrase 'a person recovering from schizophrenia'. For employers in Group B, that phrase was absent from the form.

The hypotheses

Alternative hypothesis: *There is a difference in ratings for 'suitability for an interview' based on whether a job applicant is described as 'a person recovering from schizophrenia' (Group A) or not (Group B).* (**non-directional, two-tailed**)

Null hypothesis: *There is no difference in ratings for 'suitability for an interview' based on whether a job applicant is described as 'person recovering from schizophrenia' (Group A) or not (Group B).*

Step 1: The table of ranks

To rank the ratings you need to consider the data from both Groups A and B at the same time (data is given in Table 1 below). The lowest number has a rank of 1. In the case where two data items are the same you add up the rank they would get and give the **mean** for those ranks. For example the rating of 12 appears four times in the table at rank position 7, 8, 9 and 10 therefore they all are given the rank of 8.5.

Where there are a lot of multiple ranks it may help to use a frequency table (see Table 1).

Calculate the sum of the ranks for Group A (R_A) and for Group B (R_B) (see Table 2).

Table 1 Frequency table.

Rating	Frequency	Rank
8	I	1
9	I	2
10	II	3 and 4
11	II	5 and 6
12	IIII	7, 8, 9 and 10
13	I	11
14	I	12
15	II	13 and 14
16	I	15
17	II	16 and 17
18	I	18

Table 2 Calculations table.

Group A participant number	Suitability for interview rating	Rank	Group B participant number	Suitability for interview rating	Rank
1	12	8.5	11	16	15
2	10	3.5	12	12	8.5
3	13	11	13	14	12
4	8	1	14	15	13.5
5	12	8.5	15	18	18
6	10	3.5	16	17	16.5
7	11	5.5	17	11	5.5
8	15	13.5	18	17	16.5
9	9	2			
10	12	8.5			
$N_A = 10$		$R_A = 65.5$	$N_B = 8$		$R_B = 105.5$

Step 2: Working out the value of U

Calculate the smaller value of U, which in this case will be Group A (the value of U is now called U_A and the number of participants in Group A is referred to as N_A).

$$U = U_A = R_A - \frac{[N_A(N_A + 1)]}{2} = 65.5 - \frac{[10 \times (10 + 1)]}{2} = 10.5$$

Step 3: The calculated and critical values

The **calculated value** of U is **10.5**

The **critical value** of U for a two-tailed test at the 0.05 level where $N_A = 10$ and $N_B = 8$ is **17** (see table of critical values, Table 3, above left).

As the calculated value of U is less than the critical value the result is **significant** ($p \leq 0.05$) and we can reject the null hypothesis and accept the alternative hypothesis: *There is a difference in ratings for 'suitability for an interview' based on whether a job applicant is described as 'a person recovering from schizophrenia' (Group A) or not (Group B)* ($p \leq 0.05$).

Practical activity on page 85

Wilcoxon: A worked example

Why Wilcoxon?

In this worked example we are looking for a difference in anger scores before and after using an **anger management** programme. This is a **repeated measures** design (i.e. related) as the same participants are assessed before and after receiving treatment. The data is **ordinal** as anger scores are based on a subjective 'unsafe' **self-report questionnaire**.

The aim

An investigation in forensic psychology was conducted to assess the effectiveness of a new anger management programme. Twelve teenagers serving time in a young offenders institute for violent crime were involved in the study. At the beginning of the investigation, all the offenders completed a questionnaire to measure their level of anger. This gave each offender an anger score out of 50. The offenders then completed eight intensive sessions of anger management. Following the treatment, the offenders completed the same anger questionnaire. The two sets of scores – before and after treatment – were compared to see if there was a difference.

The hypotheses

Alternative hypothesis: *There is a difference in young offenders' scores on an anger questionnaire before and after treatment.* (**non-directional, two-tailed**).

Null hypothesis: *There is no difference in young offenders' scores on an anger questionnaire before and after treatment.*

Step 1: Calculate a difference and rank the difference

This time ranking is done on the *difference* between the two sets of data. When ranking, the signs are ignored.

If the difference is zero the data is not included in the ranking and is deducted from the *N* value, as below.

Table 4 Calculations table.

Participant	*Anger score before treatment*	*Anger score after treatment*	*Difference*	*Rank of difference*
1	39	30	+9	7.5
2	42	44	–2	1
3	28	25	+3	3
4	35	32	+3	3
5	32	32	–	–
6	40	30	+10	9
7	50	44	+6	6
8	46	50	–4	5
9	29	20	+9	7.5
10	44	29	+15	10
11	25	28	–3	3
12	38	38	–	–

Step 2: Working out the value of *T*

The **calculated value** of *T* is the sum of the less frequent sign. The less frequent sign is *minus*, so the sum of the ranks is 1 + 5 + 3.

$T = 9$

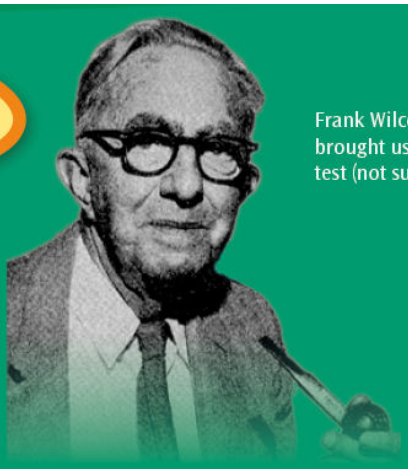
Step 3: The calculated and critical values

The **calculated value** of *T* is **9**

The **critical value** of *T* for a two-tailed test at the 0.05 level when $N = 10$ is **8** (see table of critical values, Table 5, above right).

As the calculated value of *T* is more than the critical value of *T* the result is not significant ($p \leq 0.05$) and we must accept the null hypothesis: *There is no difference in young offenders' scores on an anger questionnaire before and after treatment* ($p > 0.05$).

We reject the alternative hypothesis at $p \leq 0.05$ (i.e. less than a 5% probability that the results are due to chance) and therefore accept the null hypothesis at $p > 0.05$ (i.e. there was more than a 5% probability the results are due to chance).



Frank Wilcoxon, who brought us the Wilcoxon test (not surprisingly).

Table 5 Critical values of *T*.

Level of significance for a one-tailed test	0.05	0.025	0.01
Level of significance for a two-tailed test	0.10	0.05	0.02
N = 5	0		
6	2	0	
7	3	2	0
8	5	3	1
9	8	5	3
10	11	8	5
11	13	10	7
12	17	13	9
13	21	17	12
14	25	21	15
15	30	25	19

Calculated value of *T* must be EQUAL TO or LESS THAN the critical value in this table for significance to be shown.

Apply it

Methods

Using the critical values table

In a similar investigation, a matched pairs design was used to assess the effectiveness of the anger management programme. 20 offenders were matched on anger score at the beginning of the investigation and one from each pair was allocated either to the treatment condition (eight sessions of anger management) or the control condition (no treatment). Anger scores were assessed at the end of the investigation.

The calculated value of *T* was 6. The hypothesis was non-directional. Note that, in a matched pairs design, the *N* value is based on the number of pairs (10).

Questions

1. Is the result significant? Explain your answer. (*3 marks*)
2. What conclusion can be drawn from this study? (*2 marks*)

Check it

A researcher was interested to know whether there was a gender difference in 'enjoyment rating' of A level Psychology students.

1. Which statistical test would be used to analyse the data? Justify your choice. *[4 marks]*
2. When would a researcher decide to use a Wilcoxon test? Refer to **three** factors in your answer. *[3 marks]*

Parametric tests: Unrelated and related *t*-tests

The specification says...

> Students should demonstrate knowledge and understanding of inferential testing and be familiar with the use of inferential tests.

These two difference tests are used when data is *interval*. These are more powerful than the non-parametric Mann–Whitney and Wilcoxon tests.

Table 2 Critical values of *t*.

Level of significance for a one-tailed test	0.05	0.025
Level of significance for a two-tailed test	0.10	0.05
df = 1	6.314	12.706
2	2.920	4.303
3	2.353	3.182
4	2.132	2.776
5	2.015	2.571
6	1.943	2.447
7	1.895	2.365
8	1.860	2.306
9	1.833	2.262
10	1.812	2.228
11	1.796	2.201
12	1.782	2.179
13	1.771	2.160
14	1.761	2.145
15	1.753	2.131
16	1.746	2.120
17	1.740	2.110
18	1.734	2.101
19	1.729	2.093
20	1.725	2.086
21	1.721	2.080
22	1.717	2.074
23	1.714	2.069
24	1.711	2.064
25	1.708	2.060
30	1.697	2.042
40	1.684	2.021
60	1.671	2.000
120	1.658	1.980

Calculated value of *t* must be EQUAL TO or MORE THAN the critical value in this table for significance to be shown.

Apply it Methods

Increasing sample size

Question

If this study was repeated with 61 boys and 61 girls, and the same calculated value was achieved, would the result be significant? Explain your answer. (*3 marks*)

Unrelated *t*-test: A worked example

Why the unrelated *t*-test?

The **unrelated *t*-test** is a test of difference between two sets of data. It is used with **interval** level data only. When an **independent groups design** is used, the test selected is the unrelated *t*-test.

In this worked example, we are looking for a difference in the time taken to complete a jigsaw puzzle between boys and girls. The type of design is independent groups (unrelated) because one group were girls and the other group were boys. The criteria for a **parametric test** were fulfilled: the level of measurement is interval as time taken to complete a jigsaw puzzle is measured on a 'safe' scale (a scale of public measurement) made up of equal units. It is assumed that the participants are drawn from a **normally distributed** population and there is **homogeneity of variance** as the standard deviations in both groups are similar.

The aim

An investigation of **gender** looked into whether there was a difference in visuo-spatial ability between boys and girls. Ten girls and ten boys took part in the test which involved completing a simple jigsaw puzzle in the shortest time possible. The time it took for each participant was recorded and compared.

The hypotheses

Alternative hypothesis: *There is a difference in the time taken by boys and girls to complete a jigsaw puzzle.* (**non-directional, two-tailed**)

Null hypothesis: *There is no difference in the time taken by boys and girls to complete a jigsaw puzzle.*

Step 1: The table of data

In Table 1 below various calculations need to be made for the Group A and B scores:

- Calculate the sum of the scores for Group A ($\sum X_A$). X_A refers to scores in Group A.
- Repeat for Group B ($\sum X_B$).
- Square each value in Group A (X_A^2) and calculate sum of all squared values.
- Repeat for Group B (X_B^2).

$\sum$ means 'sum of'. See completed table (below).

Table 1 Calculations table.

Group A Boys	*Time taken (sec)* X_A	X_A^2	*Group B Girls*	*Time taken (sec)* X_B	X_B^2
1	64	4096	1	52	2704
2	56	3136	2	59	3481
3	89	7921	3	90	8100
4	55	3025	4	112	12544
5	79	6241	5	84	7056
6	102	10404	6	73	5329
7	80	6400	7	79	6241
8	69	4761	8	64	4096
9	69	4761	9	49	2401
10	80	6400	10	90	8100
	$\sum X_A = 743$	$\sum X_A^2 = 57145$		$\sum X_B = 752$	$\sum X_B^2 = 60052$

Step 2: Working out the value of *t*

$$t = \frac{(\bar{X}_A - \bar{X}_B)}{\sqrt{\left(\frac{S_A + S_B}{N_A + N_B - 2}\right) \times \left(\frac{N_A + N_B}{N_A N_B}\right)}}$$

Where: $S_A = \sum X_A^2 - \frac{(\sum X_A)^2}{N_A}$

$S_B = \sum X_B^2 - \frac{(\sum X_B)^2}{N_B}$

$\bar{X}$ stands for the mean. N_A and N_B are the numbers of scores in Group A and B.

$$t = \frac{(74.3 - 75.2)}{\sqrt{\left(\frac{1940.1 + 3501.6}{10 + 10 - 2}\right) \times \left(\frac{10 + 10}{100}\right)}} = -0.116$$

$S_A = 57145 - 55204.9 = 1940.1$

$S_B = 60052 - 56550.4 = 3501.6$

Step 3: The calculated and critical values

The **calculated value** of $t = \mathbf{-0.116}$ (note that *t* is a negative value because the mean for Group B was larger than Group A. When checking the critical values table ignore the negative sign.)

The **critical value** (in Table 2) for a two-tailed test at the 0.05 level where $df = N_A + N_B - 2 = 18$, is **2.101**

As the calculated value (ignoring the sign) is less than the critical value ($p \leq 0.05$) the result is not **significant** and we must accept the null hypothesis: *There is no difference between boys and girls in the time taken to complete a jigsaw puzzle* ($p > 0.05$).

Practical activity on page 85

Related *t*-test: A worked example

Why the related *t*-test?

When a **repeated design** is used the test selected is the **related *t*-test**.

Here, we are looking for a difference in the average heart rate before and after treatment (**CBT**). The type of design is **repeated measures** (related) because the same participants were tested twice. The level of measurement is interval as measurements of heart rate (beats per minute, bpm) are based on a 'safe' scale (a scale of public measurement) made up of equal units. Let us assume for the purpose of this test that participants were drawn from a **normally distributed** population and **homogeneity of variance** between the two data sets is assumed as this is a related design.

The aim

In a study of **addiction**, researchers investigated the effects of CBT on the physiological arousal of gamblers. Ten participants who were categorised as 'persistent gamblers' were given a six-week course of CBT to change their gambling behaviour. Before treatment, all of the participants played on a fruit machine for 20 minutes whilst their heart rate activity was monitored as a measure of physiological arousal. Following treatment, the same participants played on the same game for the same length of time and their heart rate activity was monitored.

The hypotheses

Alternative hypothesis: *There is a reduction in heart rate activity when comparing heart rate before and after CBT.* (**directional, one-tailed**)

Null hypothesis: *There is no difference in heart rate activity comparing heart rate before and after CBT.*

Step 1: The table of data

In Table 3 below, various calculations need to be made for Condition A and B:

- Calculate the difference (d) between scores for Condition A and Condition B.
- Square each difference (d^2).
- Add up the values in the d column to give the sum of d ($\sum d$).
- Add up the values in the d^2 column to give the sum of d^2 ($\sum d^2$).

Table 3 Calculations table.

Participant	*Condition A Heart rate (bpm) before treatment*	*Condition B Heart rate (bpm) after treatment*	*Difference* (d)	d^2
1	84	80	4	16
2	71	70	1	1
3	52	55	–3	9
4	66	58	8	64
5	58	58	0	0
6	77	70	7	49
7	63	61	2	4
8	81	75	6	36
9	71	74	–3	9
10	70	61	9	81
			$\sum d = 31$	$\sum d^2 = 269$

Step 2: Working out the value of *t*

$$t = \frac{\sum d}{\sqrt{\frac{N\sum d^2 - (\sum d)^2}{N-1}}} = \frac{31}{\sqrt{\frac{(10 \times 269) - (31 \times 31)}{10-1}}} = \frac{31}{\sqrt{\frac{2690 - 961}{9}}} = \frac{31}{\sqrt{192.11}} = 2.237$$

Step 3: The calculated and critical values

The **calculated value** of t is **2.237**

The **critical value** of t (in Table 2 on the facing page) for a one-tailed test at the 0.05 level where $df = N - 1 = 9$, is **1.833**

As the calculated value of t is greater than the critical value ($p > 0.05$) the result is significant and we can reject the null hypothesis and conclude: *There is a reduction in heart rate activity when comparing heart rate before and after CBT* ($p > 0.05$).



Andrea appeared to have misunderstood the suggestion from her psychology teacher that she should carry out a *t*-test.

Apply it
Methods

t-tests and taxi drivers

Read the Maguire *et al*. taxi driver study on page 40. A different researcher wanted to assess whether there was a *change* in taxi drivers' hippocampal volume as a result of taking 'The Knowledge' test. They analysed the hippocampal volume of 26 trainee London cabbies before they began studying for the test. After all the drivers had completed their training and taken 'The Knowledge' test, the researchers took the same measurement again.

Questions

1. Write a directional hypothesis for the study described above. (*2 marks*)
2. Which of the two *t*-tests should be used to analyse the data? Justify your answer. (*2 marks*)
3. The calculated value of t was 1.526. Is the result significant? Explain your answer. (*3 marks*)
4. What conclusion can be drawn from this study? (*2 marks*)

You might be required to calculate the degrees of freedom (*df*):

Pearson's r $df = N - 2$

Related *t*-test $df = N - 1$

Unrelated *t*-test $df = N_A + N_B - 2$

(N_A is the number of participants in condition A and N_B is the number of participants in condition B).

Check it

1. A researcher wanted to know whether A level PE students could throw a ball further than A level Geography students.
   Which statistical test would be used to analyse the data? Justify your choice. *[4 marks]*
2. When would a researcher decide to use a related *t*-test? Refer to **three** factors in your answer. *[3 marks]*

Tests of correlation: Spearman's and Pearson's

The specification says...

> Students should demonstrate knowledge and understanding of inferential testing and be familiar with the use of inferential tests.

Both of the tests featured here are looking for a correlation between co-variables rather than a difference between sets of scores.

Spearman's can be used with *ordinal* or *interval* data. Pearson's test can only be used if the data is *interval*.

Table 2 Critical values of *rho*.

Level of significance for a one-tailed test	0.05	0.025
Level of significance for a two-tailed test	0.10	0.05
N = 4	1.000	
5	.900	1.000
6	.829	.886
7	.714	.786
8	.643	.738
9	.600	.700
10	.564	.648
11	.536	.618
12	.503	.587
13	.484	.560
14	.464	.538
15	.443	.521
16	.429	.503
17	.414	.485
18	.401	.472
19	.391	.460
20	.380	.447
25	.337	.398
30	.306	.362

Calculated value of *rho* must be EQUAL TO or MORE THAN the critical value in this table for significance to be shown.

Apply it
Methods **Calculation**

A similar investigation with the same hypothesis was conducted with 19 couples. The sum of the difference between the ranks squared (Σd^2) was calculated to be 1000.

Questions

1. Substitute the correct values into the formula on the right and calculate *rho*. (*3 marks*)
2. Estimate the value of *rho* based on the values in the formula for question 1. (*1 mark*)
3. Explain whether or not the calculated value of *rho* in question 1 is significant. (*2 marks*)

Spearman's *rho*: A worked example

Practical activity for both tests on pages 84 and 85

Why Spearman's *rho*?

Spearman's is a test of **correlation** between two sets of values. The test is selected when one or both of the variables are **ordinal level** (though it can be used with interval data). The type of design is not an issue here as the investigation is correlational rather than experimental.

In this worked example, we are looking for a **positive correlation** between the attractiveness ratings given to each member of the couples. The level of measurement is ordinal as data is based on scores on an 'unsafe' scale (subjective ratings of attractiveness) which are converted to ranks for the purposes of the test.

The aim

A study of relationships was conducted to investigate the **matching hypothesis** (Walster *et al.* 1966, see page 122) which proposes that couples in a long-term relationship tend to be similar in terms of physical attractiveness. Twelve couples were selected for the study. Each partner had their photograph taken and these photographs were placed in a random order so it was not obvious who was in a relationship with whom.

The 24 photographs were then given to 20 participants (who had never met any of the couples before). The participants were asked to rate the person in each photograph – out of 20 – in terms of their physical attractiveness. The median attractiveness rating for each photograph was calculated to see if there was a **significant** correlation between pairs in a couple.

The hypotheses

Alternative hypothesis: *There is a positive correlation between ratings of physical attractiveness given to two partners in a relationship.* (**directional, one-tailed**)

Null hypothesis: *There is no correlation between ratings of physical attractiveness given to two partners in a relationship.*

Step 1: The table of ranks

Rank each set of scores separately in each group/condition (in this case, for each partner in the couple) from lowest to highest. As before, if two or more scores share the same ranks, find the **mean** of their total ranks.

Step 2: Calculate the difference

Find the difference between each pair of ranks and square the difference (as shown in the table below). Finally add up the squared differences, ∑ means 'sum of'.

Table 1 Calculations table.

Median physical attractiveness rating for female (out of 20)	*Rank for female partner*	*Median physical attractiveness rating for male (out of 20)*	*Rank for male partner*	*Difference between ranks* (d)	d^2
12.5	8	11	2.5	5.5	30.25
16	10	12	4.5	5.5	30.25
13	9	13	6.5	2.5	6.25
8.5	2	14.5	9	–7	49
12	7	15	10.5	–3.5	12.25
10	4.5	7	1	3.5	12.25
11.5	6	13.5	8	–2	4
7	1	15	10.5	–9.5	90.25
9	3	11	2.5	0.5	0.25
17	11	18.5	12	–1	1
18	12	12	4.5	7.5	56.25
10	4.5	13	6.5	–2	4
				$\sum d^2$ =	296

Step 3: Working out the value of *rho*

$$rho = 1 - \frac{6\sum d^2}{N(N^2-1)} \qquad = 1 - \frac{6 \times 296}{12(144-1)} \qquad = 1 - \frac{1776}{1716} \qquad = -.035$$

Step 4: The calculated and critical values

The **calculated value** of *rho* is **–.035**

The **critical value** of *rho* (in Table 2) for a one-tailed test at the 0.05 level where $N = 12$ is **.503**

As the calculated value of *rho* (ignoring the sign) is less than the critical value ($p \leq 0.05$) the result is not **significant** and we must accept the null hypothesis: *There is no correlation between ratings of physical attractiveness given to two partners in a relationship* ($p \leq 0.05$).

In addition the result is actually in the wrong direction (negative rather than positive) and so the hypothesis would not be accepted even if the calculated value was sufficiently large.

Pearson's *r*: A worked example

Why Pearson's?

Pearson's is a test of correlation between two sets of values. This test is selected when the data is **interval level**. The type of design is not an issue here as the investigation is correlational rather than experimental.

In this worked example, we are looking for a positive correlation between the length of time (in days) spent using **biofeedback** and the reduction in resting heart rate (measured in beats per minute, bpm). The level of measurement is interval as data is based on 'safe' mathematical (public measurement) scales. The investigation meets the criteria for a **parametric test**.

The aim

An investigation into **stress** was carried out to see if there is a relationship between the length of time using biofeedback (see page 276) and resting heart rate (bpm). Ten participants experiencing chronic stress who had all been using biofeedback for varying lengths of time were selected for the study.

The researchers hypothesised that those who had been using the technique for the longest would have experienced the biggest reduction in their resting heart rate. Medical records were checked so that the participants' baseline heart rate (before using biofeedback) could be compared with their present heart rate to work out the reduction. This reduction was correlated with the length of time (in days) that they had been using biofeedback.

The hypotheses

Alternative hypothesis: *There is a positive correlation between the number of days participants have been using biofeedback and the reduction in their resting heart rate (bpm).* (**directional, one-tailed**)

Null hypothesis: *There is no correlation between the number of days participants have been using biofeedback and the reduction in their resting heart rate.*

Step 1: The table of data

In Table 3 various calculations need to be made for the x and y scores:

- Calculate the sum of the scores for x ($\sum x$) and y ($\sum y$).
- Square each x value and each y value. Calculate $\sum x^2$ and $\sum y^2$.
- Multiply x and y for each participant. Add these values together = $\sum(xy)$.

Table 3 Calculations table.

Participant	*Days spent using biofeedback* (x)	x^2	*Reduction in heart rate* (y)	y^2	xy
1	4	16	2	4	8
2	7	49	2	4	14
3	15	225	4	16	60
4	22	484	6	36	132
5	23	529	5	25	115
6	32	1024	5	25	160
7	44	1936	2	4	88
8	51	2601	8	64	408
9	62	3844	7	49	434
10	80	6400	8	64	640
	$\sum x = 340$	$\sum x^2 = 17108$	$\sum y = 49$	$\sum y^2 = 291$	$\sum(xy) = 2059$

Step 2: Working out the value of *r*

$$r = \frac{N(\sum xy) - (\sum x)(\sum y)}{\sqrt{[N\sum x^2 - (\sum x)^2][N\sum y^2 - (\sum y)^2]}}$$

$$r = \frac{10(2059) - (340)(49)}{\sqrt{(171080 - 115600)(2910 - 2401)}} = \frac{3930}{5314} = +.740$$

Step 3: The calculated and critical values

The **calculated value** of r is **+.740**

The **critical value** of r (in Table 4) for a one-tailed test at the 0.05 level where $df = N - 2 = 8$, is **.549**

As the calculated value of r is more than the critical value the result is significant at the 0.05 level and we can reject the null hypothesis and accept the alternative hypothesis: *There is a positive correlation in the number of days participants have been using biofeedback and the reduction in their resting heart rate ($p \leq 0.05$).*

Table 4 Critical values of *r*.

Level of significance for a one-tailed test	0.05	0.025
Level of significance for a two-tailed test	0.10	0.05
df = 2	.9000	.9500
3	.805	.878
4	.719	.811
5	.669	.754
6	.611	.707
7	.581	.666
8	.549	.631
9	.511	.601
10	.497	.576
11	.476	.553
12	.475	.531
13	.441	.514
14	.416	.497
15	.411	.481
16	.400	.468
17	.389	.456
18	.378	.444
19	.369	.433
20	.360	.413
25	.313	.381
30	.196	.349
35	.175	.315
40	.157	.304
45	.143	.188
50	.131	.173
60	.111	.150
70	.195	.131
80	.183	.117
90	.173	.105
100	.164	.195

Calculated value of *r* must be EQUAL TO or MORE THAN the critical value in this table for significance to be shown.

Apply it

Methods

Using the critical values table

A researcher was interested to know if there was a positive correlation between heat and aggression. He made a note of the average temperature in his local town on various days throughout the year. He also recorded the number of violent incidents that were reported in the local newspapers on those days.

The researcher used a Pearson's test to analyse his data. The calculated value of *r* was 0.281. Data for daily temperature and number of violent incidents was recorded for 52 days throughout the year.

Questions

1. Is the result significant? Explain your answer. (*3 marks*)
2. What conclusion can be drawn from this study? (*2 marks*)

Check it

1. When would a researcher decide to use a Spearman's *rho* test? Refer to **two** factors in your answer. *[2 marks]*
2. When would a researcher decide to use a Pearson's *r* test? Refer to **two** factors in your answer. *[2 marks]*

Test of association: Chi-Squared

The specification says...

> Students should demonstrate knowledge and understanding of inferential testing and be familiar with the use of inferential tests.

There is one final statistical (inferential) test that you have to study, the Chi-Squared test, which can be used for differences or association.

The key feature of Chi-Squared is that each data item is not listed separately but, instead, a frequency count is given. Usually the data is entered in 4 cells (a 2 x 2 table), but 6 cells or 9 cells etc. can be used and then the contingency table is called 3 x 2 or 3 x 3 respectively. The first number identifies the number of rows and the second number is the number of columns.

The data in each cell must be independent – imagine that each data item is one person, each person can only be placed in one cell of the contingency table (Table 1) below right.

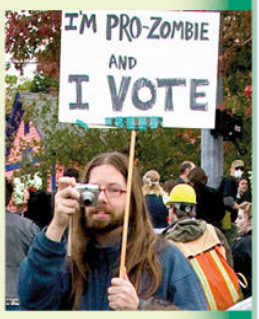
Table 3 Critical values of χ^2

Level of significance for a one-tailed test	0.10	0.05	0.025	0.01
Level of significance for a two-tailed test	0.20	0.10	0.05	0.02
df = 1	1.64	2.71	3.84	5.41
2	3.22	4.60	5.99	7.82
3	4.64	6.25	7.82	9.84
4	5.99	7.78	9.49	11.67

Calculated value of χ^2 must be EQUAL TO or MORE THAN the critical value in this table for significance at the level shown.

Apply it Methods — Calculating Chi

A researcher wanted to see whether there was an association between age and voting preference in the General Election. One hundred voters were classified as either young (under 25) or old (over 60). Of the 50 'young' voters, 42 voted for the Pro-Zombie Party and 8 for the Anti-Zombie Party. Of the 50 'old' voters, 32 voted for the Anti-Zombie Party and 18 for the Pro-Zombie Party.



Questions

1. Construct a 2 × 2 contingency table for the data above. (3 *marks*)
2. Calculate the value of χ^2 for the data above. (3 *marks*)
3. Explain whether the value of χ^2 you calculated in question 2 is significant. (2 *marks*)
4. Suggest *one* conclusion that could be drawn from your answer to question 3. (2 *marks*)

Practical activity on page 85

Chi-Squared

Why Chi?

Chi-Squared is a test of *difference* or *association*. The data is **nominal** and recorded as a frequency count of the categories.

In this worked example, we are looking for a difference in the ability to **decentre** in children aged 5 and children aged 8. There are two **independent groups** of children which means the design is **unrelated**. Finally, the level of measurement is nominal as data is collected in the form of frequencies in two categories – ability to decentre or not.

The aim

A study of **cognitive development** was conducted to see if there was a difference in children's ability to decentre (see the world from the perspective of another) depending on their age. A group of 5-year-olds and 8-year-olds were given the **three mountains task** (see page 180) to see whether they could choose a photograph that corresponded to a doll's view rather than their own.

The hypotheses

Alternative hypothesis: *More 8-year-olds than 5-year-olds are able to select a photograph that represents a perspective different from their own.* (**directional, one-tailed**)

Null hypothesis: *There is no difference between the number of 5-year-olds and 8-year-olds who can select a photograph that represents a perspective different from their own.*

Step 1: A 2 × 2 contingency table

Draw a 2 × 2 contingency table showing the *observed frequencies* (i.e. the data that was collected) in each cell and calculate the totals for each row, each column and the overall total.

Table 1 Contingency table.

	5-year-olds	8-year-olds	Totals
Could decentre	6 (cell **A**)	28 (cell **B**)	34
Could not decentre	27 (cell **C**)	9 (cell **D**)	36
Totals	33	37	70

Step 2: The table of expected frequencies

Expected frequencies (E) are now calculated for each of the four cells in the 2 × 2 table. An expected frequency is the frequency that would be expected if there was no difference between the two groups (i.e. *if the age of the child had no effect on their ability to decentre*). The expected frequency is calculated for each cell by multiplying the total for the row by the total for the column divided by the grand total.

This calculation is done as shown below, taking the data from Table 1.

O = observed frequencies from the table in Step 1.

Table 2 Calculations table.

	E	O–E	$(O–E)^2$	$(O–E)^2 / E$
Cell A	34×33/70 = 16	6 – 16 = –10	100	6.3
Cell B	34×37/70 = 18	28 – 18 = 10	100	5.6
Cell C	36×33/70 = 17	27 – 17 = 10	100	5.9
Cell D	36×37/70 = 19	9 – 19 = –10	100	5.3
				$\sum(O–E)^2 / E = 23.1$

Answers have been rounded to the nearest whole number, except in the final column where they are rounded to one decimal place. This has been done to save space, normally you should work to two or even three decimal places.

Step 3: Working out the value of χ^2

$\chi^2 = \sum(O–E)^2 / E = 23.1$

Step 4: The calculated and critical values

The **calculated value of** χ^2 is **23.1**

To find the **critical value**, calculate the **degrees of freedom** (*df*) by multiplying (*rows* – 1) × (*columns* – 1) = 1 ('rows' and 'columns' refers to the contingency table.)

The critical value of χ^2 (in Table 3) for a one-tailed test at the 0.05 level, where *df* = 1, is **2.71**

As the calculated value of χ^2 is more than the critical value ($p \leq 0.05$) we can reject the null hypothesis and accept the alternative hypothesis: *More 8-year-olds than 5-year-olds are able to select a photograph that represents a perspective different from their own* ($p \leq 0.05$).

Reporting psychological investigations

Sections of a scientific report

Abstract

The first section in a journal article is a short summary / **abstract** (150–200 words in length) that includes all the major elements: the aims and hypotheses, method/procedure, results and conclusions. When researching a particular topic, psychologists will often read lots of abstracts in order to identify those studies that are worthy of further examination.

Introduction

The **introduction** is a literature review of the general area of research detailing relevant theories, concepts and studies that are related to the current study. The research review should follow a logical progression – beginning broadly and gradually becoming more specific until the **aims** and **hypotheses** are presented.

Method

Split into several subsections, the **method** should include sufficient detail so that other researchers are able to precisely **replicate** the study if they wish:

- *Design* – the design is clearly stated, e.g. independent groups, naturalistic observation, etc., and reasons/justification given for the choice.
- *Sample* – information related to the people involved in the study: how many there were, biographical/demographic information (as long as this does not compromise anonymity), the **sampling method** and **target population**.
- *Apparatus/materials* – detail of any assessment instruments used and other relevant materials.
- *Procedure* – a 'recipe-style' list of everything that happened in the investigation from beginning to end. This includes a verbatim record of everything that was said to participants: **briefing**, **standardised instructions** and **debriefing**.
- *Ethics* – an explanation of how these were addressed within the study.

Results

The **results** section should summarise the key findings from the investigation. This is likely to feature **descriptive statistics** such as tables, graphs and charts, measures of central tendency and measures of dispersion.

Inferential statistics should include reference to the choice of **statistical test**, **calculated** and **critical values**, the **level of significance** and the final outcome, i.e. which hypothesis was rejected.

Any **raw data** that was collected and any calculations appear in an appendix rather than the main body of the report.

If the researcher has used **qualitative methods** of research, the results/findings are likely to involve analysis of themes and/or categories.

Discussion

There are several key elements in the **discussion** section. The researcher will summarise the results/findings in verbal, rather than statistical, form. These should be discussed in the context of the evidence presented in the introduction and other research that may be considered relevant.

The researcher should discuss the limitations of the present investigation and this may include some suggestions of how these limitations might be addressed in a future study.

Finally, the wider implications of the research are considered. This may include real-world applications of what has been discovered and what contribution the investigation has made to the existing knowledge-base within the field.

Referencing

Referencing includes full details of any source material cited in the report.

Journal references follow the format: author(s), date, article title, journal name (in italics), volume(issue), page numbers. For example:

> Gupta, S. (1991) Effects of time of day and personality on intelligence test scores. *Personality and Individual Differences, 12*(11), 1227–1231.

Book references take the following format: author(s), date, title of book (in italics), place of publication, publisher. For example:

> Skinner, B. F. (1953) *Science and Human Behaviour.* New York: MacMillan.

Web references provide source, date, title, weblink and date accessed. For example:

> NHS (2018) Phobias: https://www.nhs.uk/conditions/phobias/ [Accessed May 2020].

The specification says...

Reporting psychological investigations. Sections of a scientific report: abstract, introduction, method, results, discussion and referencing.

When psychologists come to write up their research for publication in journal articles, they use a conventional format. On this half-spread we describe each of the sections that make up a scientific report.

Key terms

Abstract The key details of the research report.

Introduction A look at past research (theories and/or studies) on a similar topic. Includes the aims and hypothesis of current investigation.

Method A description of what the researcher(s) did, including design, sample, apparatus/materials, procedure, ethics.

Results A description of what the researcher(s) found, including descriptive and inferential statistics.

Discussion A consideration of what the results of a research study tell us in terms of psychological theory.

References List of sources that are referred to or quoted in the article (e.g. journal articles, books or websites) and their full details.

Study tip

Try it! There is no formal requirement to complete coursework for A level Psychology as there used to be. However, we would definitely recommend that you carry out as many practical investigations as you can. This will give you vital understanding of issues involved in the design of studies, as well as the techniques involved in collecting, summarising and analysing data, and will be of great help to you when it comes to tackling research methods questions.

Why not write up one of your investigations in the conventional report format described here? Use one of the practical activities suggested in this book or make up your own (having checked with your teacher that what you propose to do is ethical of course!).

Check it

1. When would a researcher decide to use a Chi-Squared test? Refer to **three** factors in your answer. *[3 marks]*
2. Outline what information psychologists should include in an abstract when reporting psychological investigations. *[3 marks]*
3. Identify **and** outline **two** sections of a scientific report. *[6 marks]*
4. List **four** subsections that should be included in the method section of a psychological report. *[4 marks]*

Features of science

The specification says...

Features of science: objectivity and the empirical method; replicability and falsifiability; theory construction and hypothesis testing; paradigms and paradigm shifts.

What makes *science* scientific? And is psychology a science? On this spread we attempt to tackle both of these questions by first describing the key features and assumptions of scientific enquiry. We will then consider to what extent psychology as a social scientific discipline (rather than a 'natural' science) meets these criteria.

Key terms

Objectivity All sources of personal bias are minimised so as not to distort or influence the research process.

Empirical method Scientific approaches that are based on the gathering of evidence through direct observation and experience.

Replicability The extent to which scientific procedures and findings can be repeated by other researchers.

Falsifiability The principle that a theory cannot be considered scientific unless it admits the possibility of being proved untrue (false).

Theory construction The process of developing an explanation for the causes of behaviour by systematically gathering evidence and then organising this into a coherent account (theory).

Hypothesis testing A key feature of a theory is that it should produce statements (hypotheses) which can then be tested. Only in this way can a theory be falsified.

Paradigm A set of shared assumptions and agreed methods within a scientific discipline.

Paradigm shift The result of a scientific revolution when there is a significant change in the dominant unifying theory within a scientific discipline.



Study tip

We have distinguished between the **null hypothesis** and the **alternative hypothesis**. An alternative hypothesis might also – alternatively(!) – be referred to as a research **hypothesis**. If a researcher is using an experiment to investigate the hypothesis, the research hypothesis may be referred to as an **experimental hypothesis**. Or if the method of research is a correlation, the research hypothesis is a **correlational hypothesis**. Phew!

Features of science

Paradigms and paradigm shifts

The philosopher Thomas Kuhn (1962) suggested that what distinguishes scientific disciplines from non-scientific disciplines is a shared set of assumptions and methods – a **paradigm**. Kuhn suggested that social sciences (including psychology) lack a universally accepted paradigm and are probably best seen as 'pre-science' as distinct from natural sciences such as biology or physics. Natural sciences are characterised by having a number of principles at their core such as the theory of evolution in biology, or the standard model of the universe in physics. Psychology, on the other hand, is marked by too much internal disagreement and has too many conflicting approaches to qualify as a science and therefore is a pre-science (this view of psychology has been challenged – see below).

According to Kuhn, progress within an established science occurs when there is a scientific revolution. A handful of researchers begin to question the accepted paradigm, this critique begins to gather popularity and pace, and eventually a **paradigm shift** occurs when there is too much contradictory evidence to ignore. Kuhn cited the change from a Newtonian paradigm in physics towards Einstein's theory of relativity as an example of a paradigm shift.

Theory construction and hypothesis testing

Science tests theories – but what is a **theory**? A theory is a set of general laws or principles that have the ability to explain particular events or behaviours. **Theory construction** occurs through gathering evidence via direct observation (see the **empirical method** on the facing page). For instance, I may have a 'hunch' that **short-term memory** has a limited capacity based on the observation that people struggle to remember much when they are 'bombarded' with information. A series of **experiments** reveals that the average short-term memory span is around 7 (give or take 2) items of information. Let's call this *Berry's Law* ... OK fine, someone else got there first. But this is a good example of a theory as it proposes a simple and economical principle which appears to reflect reality. It provides understanding by explaining regularities in behaviour.

An essential component of a theory is that it can be scientifically tested. Theories should suggest a number of possible **hypotheses** – for instance, *Berry's Law* (see, it's catching on...) suggests that people will remember 7-digit postcodes more effectively than 14-digit mobile phone numbers. A hypothesis like this can then be tested (**hypothesis testing**) using systematic and objective methods to determine whether it will be supported or refuted. In the case of the former, the theory will be strengthened. In the case of the latter, the theory may need to be revised or revisited. The process of deriving new hypotheses from an existing theory is known as deduction.

Apply it
Methods

Does psychology have a paradigm?

Kuhn's argument was that psychology's lack of an accepted paradigm means it is yet to achieve the status of normal science, and is instead, pre-science. Certainly there are a number of theoretical perspectives in psychology that have suggested quite different ideas and ways of investigating the human subject.

However, not all commentators agree with Kuhn's conception of psychology as pre-scientific. For instance, the vast majority of researchers would accept a definition of psychology as *the study of mind and behaviour* suggesting there is broad agreement. Similarly, it could be argued that psychology has already progressed through several paradigm shifts from Wundt's early structuralism to the dominant cognitive neuroscience model of today.

Finally, several researchers (including Feyerabend 1975) have suggested that Kuhn's conception of 'proper' science as orderly and paradigmatic is flawed, and that most sciences are in fact characterised by internal conflict, dispute and a refusal to accept new ideas in the face of evidence.

Questions

1. Choose *two* approaches in psychology and explain how the main assumptions and methods of enquiry within these two approaches differ. (*6 marks*)
2. Use your knowledge of the historical development of psychology to explain how the discipline may have experienced several paradigm shifts. (*4 marks*)

Falsifiability

Another philosopher of science whose work appeared around the same time as Thomas Kuhn was Karl Popper (1934) who argued that the key criterion of a scientific theory is its **falsifiability**. Genuine scientific theories, Popper suggested, should hold themselves up for hypothesis testing and the possibility of being proven *false*. He believed that even when a scientific principle had been successfully and repeatedly tested, it was not necessarily true. Instead it had simply not been proven false – yet! This became known as the *theory of falsification*. Popper drew a clear line between good science, in which theories are constantly challenged and therefore can potentially be falsified, and what he called 'pseudosciences' which couldn't be falsified.

Those theories that survive most attempts to falsify them become the strongest – not because they are necessarily true – but because, despite the best efforts of researchers, they have not been proved false (which provides them with some strength). This is why psychologists avoid using phrases such as *'this proves'* in favour of *'this supports'* or *'this seems to suggest'* – and why, as we have seen, an alternative hypothesis must always be accompanied by a **null hypothesis** (this allows for falsifying the hypothesis).

Replicability

An important element of Popper's **hypothetico-deductive method** (described above) is **replicability**. If a scientific theory is to be 'trusted', the findings from it must be shown to be repeatable across a number of different contexts and circumstances.

Replication has an important role in determining the **validity** of a finding. We have already discussed the role of **replication** in determining the **reliability** of the *method* used in a study (see pages 66–67). Replication is also used to assess the validity of a *finding* – by repeating a study, as Popper suggests, over a number of *different* contexts and circumstances then we can see the extent to which the findings can be **generalised**. In order for replicability to become possible, it is vital that psychologists report their investigations with as much precision and rigour as possible, so other researchers can seek to *verify* their work and verify the findings they have established.

Objectivity and the empirical method

Scientific researchers must strive to maintain **objectivity** as part of their investigations. In other words, they must keep a 'critical distance' during research. They must not allow their personal opinions or biases to 'discolour' the data they collect or influence the behaviour of the participants they are studying. As a general rule, those methods in psychology that are associated with the greatest level of **control** – such as **lab experiments** – tend to be the most objective.

Objectivity is the basis of the **empirical method**. The word *empiricism* is derived from the Greek for 'experience' and empirical methods emphasise the importance of data collection based on direct, sensory experience. The **experimental method** and the **observational method** are good examples of the empirical method in psychology. Early empiricists such as John Locke saw knowledge as determined only by experience and sensory perception. Thus, according to Locke's view, a theory cannot claim to be scientific unless it has been empirically tested and verified.



'It is a capital mistake to theorise before you have all the evidence. It biases the judgement.'

Sherlock Holmes, *A Study in Scarlet*

Apply it
Methods

Psychology as a science: the case for ...

Scientific psychology lifts everyday understanding of human behaviour above the level of common sense. Critics of psychology may claim it amounts to little more than common sense, but many key findings in psychology are counter-intuitive and not what a common-sense view would predict.

By adopting a scientific model of enquiry, psychology gives itself greater credibility by being placed on equal footing with other, more established sciences (despite Kuhn's suggestion that psychology is just a pre-science).

The scientific approach in psychology has provided many practical applications that have improved people's lives and challenged/modified dysfunctional behaviour.

Questions

1. As an example of counter-intuitive findings, explain why Milgram's findings were not what most people would have predicted. (*3 marks*)
2. List at least *two* practical applications of psychology and examine their effectiveness. (*1 mark for each application*)

Apply it
Methods

Psychology as a science: the case against ...

Although many psychologists try to maintain objectivity within their research, some of the methods that psychologists use are subjective, non-standardised and unscientific.

Science is based on the assumption that it is possible to produce universal laws that can be generalised across time and space. However, this may not be possible in psychology – samples of participants in studies are rarely representative and conclusions drawn may often be influenced by cultural and social norms.

Much of the subject matter in psychology cannot be directly observed and must be based on inference rather than objective measurement.

Questions

1. Provide an example of subjective methods in psychology, with reference to specific studies. (*2 marks*)
2. Even when more objective methods are used, explain why objectivity may be much harder to achieve in psychology than in natural sciences, e.g. physics, chemistry. (*3 marks*)
3. Why might replicability be harder to achieve in psychology than other sciences? (*3 marks*)
4. Explain which psychological approaches this most applies to and why. (*2 marks*)
5. Explain why many findings gained from experimental research may lack **ecological validity** and/or **temporal validity**. Give some examples. (*4 marks*)
6. Explain why the issue of inference is a criticism that may be levelled at the **cognitive approach**. (*3 marks*)

Check it

1. Outline what is meant by 'replicability' **and** 'falsifiability' in psychological research. *[4 marks]*
2. Outline what is meant by the following terms in scientific research: (a) paradigm (b) paradigm shifts. *[4 marks]*
3. Briefly discuss the importance of theory construction **and** hypothesis testing in scientific research. *[8 marks]*
4. Discuss features of science. *[16 marks]*

Practical corner

The specification says...

> Knowledge and understanding of ... research methods, practical research skills and mathematical skills. These should be developed through ... ethical practical research activities.

This means that you should conduct practical investigations throughout all topics. Here, we suggest some ways in which you might put your research methods skills into practice. Firstly, in the development of an IQ test which you should then assess in terms of its reliability and validity. Secondly, it's over to you for the ideas – and ways to generate data for all those fascinating statistical tests!

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?

Apply it
Methods

The maths bit

Imagine you recorded the scores the first time your participants sat the test and compared these with the scores the second time participants sat the test. Spearman's *rho* was used to work out the relationship between the two sets of scores and a correlation coefficient of +.91 was found.

Questions

1. Explain why Spearman's *rho* was used to analyse the relationship between the two sets of scores. (*4 marks*)
2. Explain what is meant by 'correlation coefficient'. (*2 marks*)
3. Explain what a correlation coefficient of +.91 means in this context. (*3 marks*)

Imagine you also asked the same participants to complete an established IQ test and compared these scores with the scores on the first test. Again, Spearman's *rho* was used to analyse the relationship and the correlation coefficient was +.57.

4. Explain what a correlation coefficient of +.57 means in this context. (*3 marks*)
5. Explain what type of **validity** is being tested in the example above. Justify your answer. (*2 marks*)
6. Outline *one* other way in which you could have assessed the validity of the IQ test. (*3 marks*)

Practical idea 1: Assessing reliability and validity of an IQ test

On pages 66–69 we talked about the importance psychologists place on designing measuring instruments that are **reliable** (consistent) and **valid** (true). Now it's your chance to develop a test of intelligence (**IQ**) and establish whether it has **test–retest reliability** and **concurrent validity**.

The aim of this study is to develop a simple form of IQ test and assess whether it is reliable and valid.

The practical bit

There are many ways of testing intelligence – puzzles, problem-solving exercises and IQ tests (IQ stands for *intelligence quotient*). Your first task is to develop a simple IQ test.

Designing the test

There are many different types of IQ test. Typically most 'traditional' forms of the test contain questions (items) that assess skills of mathematics, verbal reasoning, spatial awareness and comprehension. In order to get a 'feel' for the kind of IQ test you want to design, it would be worth having a look at a few examples online (be aware though that not all tests are free and some will charge for the results if you take the test). A good free online test can be found at the following link: www.iqtestcc.co.uk

If you feel that some of the questions you've seen may be a little difficult to design, you might want to go a different way. Instead of measuring IQ, you could test general knowledge (different from intelligence!), for example of world history, geography, current affairs, literature, etc.

Or your test could be based on one specific knowledge area, such as world football, cinema, pop music or basket weaving. The actual content of the test is not all that important, just so long as there are a decent number of questions (say, around 30–40), and some are easier and some more difficult than others.

Assessing reliability

Once you're reasonably happy with the content of your test (and you've had it checked by a teacher) you are ready to assess its reliability. On page 66 we discussed the concept of test–retest reliability. Reliable measuring instruments should produce the same (or similar) results if they are used again with the same sample of people. In order to assess this, you're going to have to find some willing participants to take the test — *twice*. Between 10 and 20 people should do the trick, but really it's the more the merrier. You need to leave a reasonable period of time between the two tests, maybe a couple of weeks, to reduce the possibility that participants will remember most of the questions (and more importantly, the answers!) Details on how to analyse the two sets of scores are included below.

Assessing validity

On page 69 we introduced the idea of concurrent validity. One way of assessing validity is to compare the scores produced on your test with the scores produced on an established test that measures the same variable (intelligence). So you're going to need to find a proven IQ test – or, you could just follow this link to the *Stanford–Binet test*, a widely recognised and well established test: www.stanfordbinet.net

The same participants who completed your test above are also required to complete the *Stanford–Binet test*. Make sure you record all the sets of scores.

Statistical analysis

Your final task is to perform two statistical analyses. The first is to determine the **correlation** between the scores produced on the test the first time the participants take it and the scores produced the second time they take it. This will assess test–retest reliability.

The second analysis is to calculate the correlation between the scores on the test (the first time participants take it) and their scores on the Stanford-Binet-test. This will assess concurrent validity.

Spearman's *rho*

Both of the calculations above require you to use **Spearman's *rho***. You will need to remind yourself of the steps involved in this test (page 78) in order to work out the **correlation coefficient** in each case. Finally, remember that in order to establish reliability and validity your correlation coefficients need to exceed .80 (*it ain't great unless it's .8 ...*).

Practical idea 2: Devising practical ideas for research

The aim of this practical is to encourage you to develop research ideas for each of the **statistical tests** described on pages 74–80.

The introductory bit

By this stage, you should have experience of designing and carrying out practical investigations on your own or in a small group. Your task is to design a further *seven* investigations (some of which you may want to carry out) to generate data for *all* of the statistical tests you have come across in this chapter. This is no mean feat and will require many of the research methods skills you have developed – as well as some careful thought ...

An investigation for Chi-Squared

Chi-Squared is the most flexible of the statistical tests and can be used to test for an *association* (relationship) or a *difference*. The level of measurement is **nominal** so data needs to be represented in the form of categories. You might want to analyse some difference between the genders as the number of male and female students (in your year group for instance) can easily be counted and recorded. Is there a difference between the number of male and female students who do and do not study psychology, for instance? Remember, you'll need to construct a **contingency table** (a 2 × 2 table) of the relevant data so you are able to calculate the difference/association you are looking for.

An investigation for Mann–Whitney

This test of difference requires **ordinal data** and **independent groups**. For this reason, it is a good test for comparing the opinions or ratings given by two different groups. Is someone's enjoyment of their A level programme influenced by whether they study psychology or not? Alternatively, **Mann–Whitney** is appropriate for measuring the difference in performance of groups on a **non-interval scale** test. Would Year 13s outperform Year 12s on the IQ test you devised on the left?

An investigation for Wilcoxon

The same criteria for Mann–Whitney apply to **Wilcoxon** except data is drawn from *related* rather than unrelated samples. If participants were *matched pairs* in the investigations above, Wilcoxon would be suitable because that is a **related design**. Alternatively participants could be asked to give a rating for something *before* and *after* they are given new information. Do students' ratings of their perceived ability in psychology change after they are told that everyone in last year's class got an A grade? (Ed – this may or may not be true of course!)

Investigations for Spearman's and Pearson's

Both of these are tests of **correlation** so there is no **experimental design** to consider here. The distinction between the two types of test is the **level of measurement**. If you are looking for a correlation between **co-variables** where at least one of these co-variables is measured at an ordinal level then you select **Spearman's** (for example, whether the number of siblings a student has is related to their self-rating of patience). If both sets of data are **interval level** then it's the **parametric** equivalent, **Pearson's** (for example, whether time taken to complete a jigsaw puzzle is related to age).

Investigations for the *t*-tests

Both forms of *t*-test analyse the difference between two sets of scores and require interval data for their use. The distinction between the **related** and **unrelated *t*-test** hinges on the type of experimental design. If this is independent groups, then the unrelated *t*-test is used – for instance, investigating whether A level PE students can throw a tennis ball further than non-PE students. In the case of matched pairs or repeated measures designs, the related *t*-test is used. For example, investigating whether the presence of an audience affects how far students throw a tennis ball.

Parametric versus non-parametric assumptions

Remember that the two *t*-tests and Pearson's are parametric tests and certain assumptions must be met for their use. You must be sure that the data you are using is interval data. Generally speaking, if data has been recorded using some specialist mathematical measuring device (such as a tape measure in the example above) it is likely to be interval data – but check with your teacher if you are unsure. Using students from your school is likely to ensure that your sample is drawn from a **normally distributed population**. Finally, if you are using a related design, **homogeneity of variance** is assumed. If your design is unrelated, you will need to work out the **standard deviations** for each condition to make sure they are *similar* (see page 71 for a discussion of parametric criteria).



Plan some investigations – on your own or with some mates (coffee optional ...).

Stats test checklist

Make sure you ...

- Write an **operationalised alternative** and **null hypothesis** at the beginning of the investigation (you'll need to accept one and reject the other at the end).
- Decide on a **directional** or **non-directional hypothesis** (and, consequently, a **one-tailed** or a **two-tailed test**) (See page 73).
- Design a well-controlled and ethical investigation – see 'Ethics check' on facing page and check this with your teacher if you intend to carry it out.
- Choose the correct statistical test.
- Select the correct **critical value** using an appropriate **level of significance** (usually 5%).



You won't have to calculate any of the statistical tests on the left in the exam but you might want to work out a couple just for – er – fun. (Also, it will help your understanding of maths and statistics in general.)

The maths bit

In the Year 1 book we gave a list of the mathematical skills you will be expected to demonstrate.

Overall, at least 10% of the marks in assessments for Psychology will require the use of mathematical skills and this is included in the requirement that at least 25–30% in total will involve research methods.

Revision summaries

Correlations

Revisiting the analysis of co-variables.

Analysis and interpretation

Correlations and correlation coefficients
Relationship between two continuous co-variables.
Correlation coefficient represents strength and direction of relationship.

Working out what a coefficient means
The closer the coefficient is to −1 or +1, the stronger the relationship.
+.50 is as strong as −.50, the sign just tells us the direction.

Case studies and content analysis

Two forms of research method.

Case studies

Case studies
Detailed analysis of an unusual individual or event, e.g. the London riots. May also be 'typical' behaviours.

Characteristics
May involve a case history.
Qualitative (e.g. interviews) and quantitative data (e.g. psychological tests).
Tend to be longitudinal.

Evaluation

Strengths
Insight into unusual cases, e.g. HM may provide understanding of normal functioning.
Generate hypotheses for future studies.

Limitations
Generalisation from small samples is a problem and conclusions based on subjective interpretation of the researcher, plus subjective data from participants.

Content analysis

Content analysis
A form of observation in which communication is studied indirectly.

Coding and quantitative data
Data must be categorised into meaningful units (and then analysed by counting words, etc).

Thematic analysis and qualitative data
Recurrent ideas (themes) that keep 'cropping up' in the communication are identified and described.

Evaluation

Strengths
Fewer ethical issues, high external validity, flexible approach because can be adapted.

Limitations
Information may be studied out of context and be subjective. Reflexivity aims to address the issue of bias.

Reliability

A measure of consistency.

Reliability

Any measurement should produce the same result unless the thing it is measuring has changed.

Ways of assessing reliability

Test–retest
The same test is administered to the same person on different occasions and results compared.

Inter-observer reliability
Observers compare data in a pilot study or at end of actual study to make sure behavioural categories are consistently applied.

Measuring reliability
Two sets of scores should correlate at least +.80 for reliability.

Improving reliability

Questionnaires
If a questionnaire has low test–retest reliability, some items may need to be changed to closed questions as these may be less ambiguous.

Interviews
Should avoid questions that are leading or ambiguous and ensure interviewers are trained.

Observations
Behavioural categories should be properly operationalised, more training may be needed.

Experiments
Standardised procedures ensures consistency when testing different participants.

Validity

A measure of 'truth'.

Types of validity

Whether a test, scale, etc, produces a legitimate result which represents behaviour in the real world.

Internal and external validity
Whether something measures what it was designed to measure, and whether findings can be generalised.

Ecological validity
The extent to which findings can be generalised from one setting to other settings.
Mundane realism of task may affect ecological validity.

Temporal validity
Whether findings from a study hold true over time.

Ways of assessing validity

Face validity
Does a test measure what it is supposed to 'on the face of it'?

Concurrent validity
Do results match with a previously established test?

Improving validity

Experimental research
Use of a control group. Standardised procedures. Single-blind and double-blind procedures.

Questionnaires
Use of lie scales and anonymity to reduce social desirability bias.

Observations
Use covert observations so behaviour more authentic, also use well-defined behavioural categories.

Qualitative research
Depth and detail may increase validity but further enhanced through triangulation.

Choosing a statistical test

Statistical tests tell us whether results are significant or due to chance.

Decisions

Statistical testing
Determine whether we can accept or reject the null hypothesis.

Decision 1. Difference or correlation?
Correlation includes tests of association (Chi-Squared).

Decision 2. Experimental design?
Related (repeated measures or matched pairs) or unrelated (independent groups).

Decision 3. Level of measurement?

Nominal data
Data represented in the form of categories, e.g. counting how many students like psychology or don't like psychology in your class.

Ordinal data
Ordered data, but unequal intervals. Can be placed in rank order, e.g. rating your liking of psychology on a scale of 1–10.

Interval data
Based on numerical and public scales of measurement with units of equal size, e.g. length, temperature.

Parametric tests
Used with interval level data, normal distribution expected and satisfies homogeneity of variance (standard deviation squared).

Probability and significance

Psychological research works on probabilities rather than certainties.

Key concepts

The null hypothesis
The null hypothesis states no difference between conditions. Statistical tests determine whether this should be accepted or rejected.

Levels of significance and probability
The significance level is the point at which the researcher can accept the alternative hypothesis (usually 5% in psychology).

Use of statistical tables

Calculated and critical values
The calculated value must be compared with a critical value to determine significance.

Using tables of critical values
Is a one-tailed or two-tailed test required?
What is the *N* or *df* value?
Which level of significance is required (e.g. 0.05)?

Levels of significance
A more stringent level, e.g. 1%, should be used when research has a human cost or the study is a one-off.

Type I and Type II errors

Type I error
The incorrect rejection of a true null hypothesis.
More likely if significance level is too lenient (e.g. 10%).
An optimistic error.

Type II error
The incorrect acceptance of a false null hypothesis.
More likely if significance level is too stringent (e.g. 1%).
A pessimistic error.

Statistical tests

Formula for determining significance.

Non-parametric tests

Mann–Whitney *U*
Test of difference between two sets of data.
Unrelated design.
Data at least ordinal level.

Wilcoxon *T*
Test of difference between two sets of data.
Related design.
Data at least ordinal level.

Parametric tests

Unrelated *t*-test
Test of difference between two sets of data.
Unrelated design.
Data at interval level.
Parametric test – data drawn from a population with an expected normal distribution and both data sets have a homogeneity of variance.

Related *t*-test
Test of difference between two sets of data.
Related design.
Data at interval level.
Parametric test – data drawn from a population with an expected normal distribution and both data sets have a homogeneity of variance.

Tests of correlation

Spearman's *rho*
Test of correlation between co-variables.
Data at least ordinal level.

Pearson's *r*
Test of correlation between co-variables.
Data at interval level.
Parametric test – data drawn from a population with an expected normal distribution and both data sets have a homogeneity of variance.

Test of association

Chi-Squared χ^2
Test of difference between two sets of data or association between co-variables.
Data is independent.
Nominal data.

Rule of R

Rule of R
Tests with a letter 'R' in their name are those where the calculated value must be equal to or more than the critical value.

Reporting psychological investigations

Psychologists use a conventional format when presenting their research.

Sections of a scientific report

Abstract
A short summary (200 words) of the key elements in the report.

Introduction
Literature review, including aim and hypothesis.

Method
Includes design, sample, apparatus/materials, procedure, ethics.

Results
Descriptive and inferential statistics. Raw data in appendix.

Discussion
Analysis of results, links to previous research, limitations and wider implications.

Referencing
List of sources (journal articles, books, web sources). Generally includes author(s), date, title, volume/page numbers/publisher/source.

Features of science

What makes science scientific?

Key concepts

Paradigms and paradigm shifts
Scientific subjects have a shared set of assumptions (Kuhn) and a scientific revolution occurs when there is a paradigm shift.

Theory construction and hypothesis testing
Theory construction occurs through gathering evidence from direct observation.
A theory should produce testable hypotheses, thus permitting the validity of the theory to be assessed.

Falsifiability
Scientific theories must hold themselves up for hypothesis testing and the possibility of being proved false.

Replicability
If a scientific theory is to be 'trusted' (i.e. valid), its findings must be shown to be repeatable across time and context.
The methods used should also be repeatable, i.e. reliable.

Objectivity and the empirical method
Scientists must minimise all sources of personal bias and gather evidence through direct observation and experience.

Practice questions, answers and feedback

Question 1 A call centre company is conducting research to see whether the type of music customers listen to whilst they are on hold affects how long they will remain on hold. The first 200 customers who phoned the call centre on a Monday morning were told they had to be transferred to another department and were placed on hold (in reality, they were not being transferred, they were simply being placed on hold and the time it took each customer to put the phone down was recorded).

During the time on hold, 100 customers were played classical music, and the other 100 customers were played pop music. The difference in average time spent listening to classical music and pop music on hold before putting the phone down was analysed.

(a) Write a suitable non-directional hypothesis for the investigation above. (*2 marks*)

Morticia's answer *The hypothesis would be 'There is a difference between the customers who listened to classical music and the customers who listened to pop music'.*	A difference in what? The DV is not made clear.
Luke's answer *The customers who heard classical music waited longer on hold than the customers who heard pop music.*	Unfortunately, a directional hypothesis is offered by Luke.
Vladimir's answer *The kind of music that is played affects how long people stay on hold.*	Both variables are stated and the hypothesis is non-directional.

(b) Identify which sampling technique was used to recruit participants in the study. Explain your answer. (*2 marks*)

Morticia's answer *The researcher used an opportunity sample because it was just the most convenient people.*	'Most convenient people' is an odd phrase but just about enough.
Luke's answer *Opportunity sample. They were the most willing and available.*	Participants were not given the option to be 'willing', but still a sufficient answer.
Vladimir's answer *Volunteer sample because they were willing to take part.*	Vladimir's answer has no relevance.

(c) Outline one limitation of the sampling technique you have identified in (b). (*2 marks*)

Morticia's answer *Using an opportunity sample is not always the most representative.*	A limitation is stated but more detail is required.
Luke's answer *This sample may be biased because it is a narrow sample of people who happened to be at home to answer their phones.*	A more thorough answer but the link to the stem is inaccurate.
Vladimir's answer *Volunteers may be more willing than people generally which makes them unrepresentative.*	Vladimir has fully addressed a limitation of the sampling method he identified earlier. He is not penalised for making a wrong answer in the previous part.

(d) Identify which statistical test could have been used to analyse the difference in average time spent on hold in the research study in question 1. Justify your answer. (*3 marks*)

Morticia's answer *It would be a t-test for unrelated samples. This is because the study is independent groups and the data is interval.*	Morticia has produced a reasonable answer, though it is good practice to link the answer more clearly to the stem (as in Vladimir's excellent answer below). She hasn't stated that a difference test is needed.
Luke's answer *It would be a Mann–Whitney test because there are two groups of participants and we can't be sure that parametric criteria are satisfied.*	Luke's answer lacks key elements – the type of design is not named, nor is the fact that a difference is being tested for.
Vladimir's answer *Unrelated t-test because there were two groups of participants (those who heard classical or heard pop), we are looking for a difference between the groups, the data is interval (number of seconds) and parametric criteria would be satisfied.*	Vladimir has got it right.

(e) After the results had been analysed, a significant difference was found at the 0.05 level. Explain what this means in relation to the research study above. (*3 marks*)

Morticia's answer *It means that there is a 5% probability that the results were due to chance.*	Morticia's answer is the only one here that contains relevant material. The other two answers are too vague. None of the answers refers to which hypothesis would be retained and which rejected, and what this would mean in the context of the investigation.
Luke's answer *0.05 is the same as 5% which is the level of certainty we have that there was a difference.*	
Vladimir's answer *The difference was 5% certain.*	

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

As soon as customers put the phone down in the research study described on the facing page, they were called back and debriefed.

(f) Write a debriefing statement that could have been read out to customers who were played pop music whilst on hold. (*4 marks*)

Morticia's answer

I am ringing you to say that the phone call you just received was part of a research study run by Littletown University. We played music for each participant – either classical or pop – to see how long they would stay on the phone. If you'd like to know the final results of the study I can send them to you. Do you have any questions?

The aim is clearly stated in Morticia's debrief and the reference to any questions and knowledge of the final results is appropriate. She could perhaps have asked if the data could still be used.

Luke's answer

Hello, my name is Luke. I am ringing to tell you that the phone call you just received was part of a psychological study where we were investigating whether people were more willing to stay on hold if they listened to classical or pop music. We hope you were not distressed by the experience. Thank you for your time.

The aim of the investigation is clearly stated but Luke should have asked for permission to use the data. The reference to 'distress' is rather vague and unnecessary.

Vladimir's answer

This is a follow-up call to the one you just received to tell you that it was part of a psychological study. We hope it didn't upset you in any way or take up too much of your time. If you have any complaints or would like to withdraw your data then let us know now. Otherwise thank you and I'll be in touch again to tell you the results if you wish.

A good appreciation of relevant ethical issues in Vladimir's debrief. However, this answer needs more detailed reference to the aim of the study and relevant conditions.

Customers were asked if they would complete a structured interview about their experience of call centres. Those who agreed were called back and the interview was conducted over the phone.

(g) Briefly discuss **one limitation of using a structured interview in this study. (*3 marks*)**

Morticia's answer

A structured interview does not give the interviewer any opportunity to ask questions arising from the conversation during the phone interview.

Luke's answer

One limitation of a structured interview is that the interviewer can't stray from the listed questions, for example to explain the question. In this interview they might want to ask some different questions from those that were on the list.

That said, the data from structured interviews is much easier to analyse as it is more focused than that produced in unstructured interviews.

Vladimir's answer

It lacks the flexibility of an unstructured interview.

Morticia's and Vladimir's answers are briefly stated and require further elaboration – perhaps through contrast with unstructured interviews.

Luke's answer is much better for this reason. It also includes relevant counterargument which can be used as effective elaboration in a 'briefly discuss' question. However there is no reference to the study – Morticia does manage to include some context ('during the phone interview') as required in the question.

(h) Explain how the reliability **and validity of an interview in this study could have been assessed. (*5 marks*)**

Morticia's answer

The reliability could be assessed by asking the same interviewer to repeat the interview a second time with the same people and compare the answers to see if they were consistent. Validity could be checked in terms of face validity to see if the questions looked like they were assessing thoughts and feelings about call centres.

Luke's answer

For reliability you could use test-retest and repeat the interviews a second time.
For validity you could use concurrent validity and compare with another interview.

Vladimir's answer

One way to assess reliability is using the test-retest method where the same test (or questions) are given a second time to the same person. Validity could be ecological validity. The ecological validity is good because these were people just answering their phones in everyday life.

Morticia's answer is detailed and accurate. The ways of assessing reliability and validity are well explained and relevant to an interview. There is no requirement here to relate the answer to the particular study but that would be a way to provide useful detail.

Luke's answer is less successful. Two relevant methods are named but the description of these lack key details.

Vladimir's first point is relevant – though generic – but the material in the latter half of the question is not really 'assessing validity'.

Multiple-choice questions

Correlations

1. All correlation coefficients fall somewhere between:
   (a) −1 and +1.
   (b) 0 and 1.
   (c) +1 and 0.
   (d) −10 and +10.

2. As the number of people in a room increases, personal space decreases is an example of a:
   (a) Positive correlation.
   (b) Negative correlation.
   (c) Zero correlation.
   (d) Curvilinear relationship.

3. As the daily temperature goes down, people's mood rating decreases is an example of a:
   (a) Positive correlation.
   (b) Negative correlation.
   (c) Zero correlation.
   (d) Curvilinear relationship.

4. Correlations are plotted on a:
   (a) Bar chart.
   (b) Histogram.
   (c) Line graph.
   (d) Scattergram.

Case studies and content analysis

1. Case studies tend to take place over a long period of time. This is referred to as:
   (a) Longitudinal research.
   (b) Timescale research.
   (c) Hexagonal research.
   (d) Temporal research.

2. Which of the following is a strength of case studies?
   (a) The final report is not based on the subjective interpretation of the researcher.
   (b) Construct validity.
   (c) Generalisation of findings is usually possible with small sample sizes.
   (d) Study of unusual cases may contribute to our understanding of normal functioning.

3. Categorising information into meaningful units is known as:
   (a) Generalising.
   (b) Correlational.
   (c) Separating.
   (d) Coding.

4. Recognising the part that one's own biases play in the research process is called:
   (a) Reflexivity.
   (b) Rigidity.
   (c) Reactivity.
   (d) Reliability.

Reliability

1. Reliability is a measure of:
   (a) Complexity.
   (b) Conformity.
   (c) Consistency.
   (d) Clarity.

2. If two or more observers are collecting data they should first establish:
   (a) Construct validity.
   (b) Test–retest reliability.
   (c) Inter-observer reliability.
   (d) External reliability.

3. If participants are given the same questionnaire twice, for test–retest reliability the correlation must exceed:
   (a) +.70
   (b) +.80
   (c) +.90
   (d) +1.00

4. Reliability is most often achieved in which type of interview?
   (a) Structured.
   (b) Unstructured.
   (c) Semi-structured.
   (d) Television.

Validity

1. Which of the following does *not* describe validity?
   (a) Whether a test is legitimate.
   (b) Whether a test is genuine.
   (c) Whether a finding can be generalised.
   (d) Whether a test is consistent.

2. 'The extent to which findings from a research study can be generalised to other times' is a definition of:
   (a) Concurrent validity.
   (b) Temporal validity.
   (c) Face validity.
   (d) Internal validity.

3. 'The extent to which a psychological measure relates to an existing similar measure' is a definition of:
   (a) Concurrent validity.
   (b) Temporal validity.
   (c) Face validity.
   (d) Internal validity.

4. Validity can be improved through the use of a number of different sources as evidence. This is referred to as:
   (a) Reticulation.
   (b) The square peg principle.
   (c) Circle theory.
   (d) Triangulation.

Choosing a statistical test

1. Which of the following is *not* one of the criteria when deciding on a statistical test?
   (a) Whether the hypothesis is directional or non-directional.
   (b) The level of measurement.
   (c) Whether the researcher is looking for a difference or relationship.
   (d) The experimental design.

2. Which of the following tests would be used when looking for a correlation with interval level data?
   (a) Mann–Whitney.
   (b) Chi-Squared.
   (c) Pearson.
   (d) Spearman.

3. Which of the following tests would be used with nominal data?
   (a) Related *t*-test.
   (b) Wilcoxon.
   (c) Sign test.
   (d) Unrelated *t*-test.

4. Which of the following is *not* one of the three criteria required for use of a parametric test?
   (a) Data at interval level.
   (b) A test of relationship rather than difference.
   (c) Data must be drawn from a normally distributed population.
   (d) Homogeneity of variance.

Probability and significance

1. A probability of 1 would indicate:
   (a) Statistical certainty.
   (b) Statistical impossibility.
   (c) Statistical significance.
   (d) Statistical likelihood.

2. Which of the following is associated with a Type II error?
   (a) An optimistic error.
   (b) Incorrect rejection of the null hypothesis.
   (c) Incorrect acceptance of the alternative hypothesis.
   (d) Made more likely when the significance level is set too low.

3. The usual level of significance in psychological research is:
   (a) 1%.
   (b) 5%.
   (c) 10%.
   (d) 50%.

4. Which of the following is *not* required when consulting a critical values table?
   (a) Knowing the level of measurement.
   (b) Knowing whether the test is one-tailed or two-tailed.
   (c) Knowing the *N* value/degrees of freedom.
   (d) Knowing the level of significance.

Non-parametric tests: Mann–Whitney and Wilcoxon

1. **Mann–Whitney would be used when the researcher has used:**
   (a) An independent groups design.
   (b) A repeated measures design.
   (c) A matched pairs design.
   (d) A quasi-experiment.

2. **Wilcoxon would be used when the researcher has used:**
   (a) An independent groups design.
   (b) Stratified sampling.
   (c) A matched pairs design.
   (d) A quasi-experiment.

3. **Mann–Whitney and Wilcoxon are used when:**
   (a) The data is interval.
   (b) The data is nominal.
   (c) The data is ratio.
   (d) The data is ordinal or interval.

4. **Which test would be used to analyse differences on an attitude questionnaire between males and females?**
   (a) Mann–Whitney.
   (b) Wilcoxon.
   (c) Neither (a) nor (b).
   (d) Either (a) or (b).

Parametric tests: Unrelated and related *t*-tests

1. **Why are parametric tests superior to non-parametric tests?**
   (a) They use the actual data collected rather than ranks.
   (b) They are more powerful and robust than other tests.
   (c) They are more likely to detect significance in data sets.
   (d) All of the above.

2. **An unrelated *t*-test would be used when the researcher has used:**
   (a) An independent groups design.
   (b) A repeated measures design.
   (c) A matched pairs design.
   (d) A quasi-experiment.

3. ***t*-tests are used when:**
   (a) The data is interval.
   (b) The data is nominal.
   (c) The data is ordinal.
   (d) The data is independent.

4. **Which test would be used to analyse an association between gender and smoking behaviour?**
   (a) Wilcoxon.
   (b) Related *t*-test.
   (c) Neither (a) nor (b).
   (d) Either (a) or (b).

Tests of correlation: Spearman's and Pearson's

1. **Spearman's would be used when:**
   (a) The data is at least interval.
   (b) The data is at least nominal.
   (c) The data is at least ratio.
   (d) The data is at least ordinal.

2. **Pearson's would be used when:**
   (a) The data is at least interval.
   (b) The data is at least nominal.
   (c) The data is at least ordinal.
   (d) There is no data.

3. **Spearman's and Pearson's are both used to analyse:**
   (a) A correlation.
   (b) A difference.
   (c) Dispersion.
   (d) Central tendency.

4. **Which test would be used to analyse the relationship between temperature and heart rate?**
   (a) Mann–Whitney.
   (b) Pearson's.
   (c) Neither (a) nor (b).
   (d) Either (a) or (b).

Test of association: Chi-Squared and Reporting psychological investigations

1. **Chi-Squared is used when:**
   (a) The data is interval.
   (b) The data is nominal.
   (c) The data is ratio.
   (d) The data is ordinal.

2. **Observed frequencies are recorded in a:**
   (a) Consistency table.
   (b) Continuity table.
   (c) Contingency table.
   (d) Constancy table.

3. **Which of these is defined as a 150–200 word summary of the major elements of a scientific report?**
   (a) The abstract.
   (b) The design.
   (c) The discussion.
   (d) The references.

4. **Which of the following would *not* appear in the method section of a scientific report?**
   (a) Sample.
   (b) Procedure.
   (c) Discussion.
   (d) Apparatus/materials.

Features of science

1. **Kuhn referred to a shared set of assumptions and methods as a:**
   (a) Parametric.
   (b) Parapax.
   (c) Paradigm.
   (d) Parasite.

2. **Popper argued that scientific progress occurs through a process of:**
   (a) Ramification.
   (b) Amplification.
   (c) Falsification.
   (d) Materialisation.

3. **When all sources of personal bias are minimised so as not to influence the research process.**
   (a) Replicability.
   (b) Generalisability.
   (c) Falsifiability.
   (d) Objectivity.

4. **'Collecting data through direct sensory experience' refers to:**
   (a) Existentialism.
   (b) Essentialism.
   (c) Eclecticism.
   (d) Empiricism.

MCQ answers

Correlations 1A, 2B, 3A, 4D
Case studies and content analysis 1A, 2D, 3D, 4A
Reliability 1C, 2C, 3B, 4A
Validity 1D, 2B, 3A, 4D
Choosing a statistical test 1A, 2C, 3C, 4B
Probability and significance 1A, 2D, 3B, 4A
Non-parametric tests: Mann–Whitney and Wilcoxon 1A, 2C, 3D, 4A
Parametric tests: Unrelated and related *t*-tests 1D, 2A, 3A, 4C
Tests of correlation: Spearman's and Pearson's 1D, 2A, 3A, 4B
Test of association: Chi-Squared and Reporting psychological investigations 1B, 2C, 3A, 4C
Features of science 1C, 2C, 3D, 4D

Chapter 4 Issues and debates in Psychology

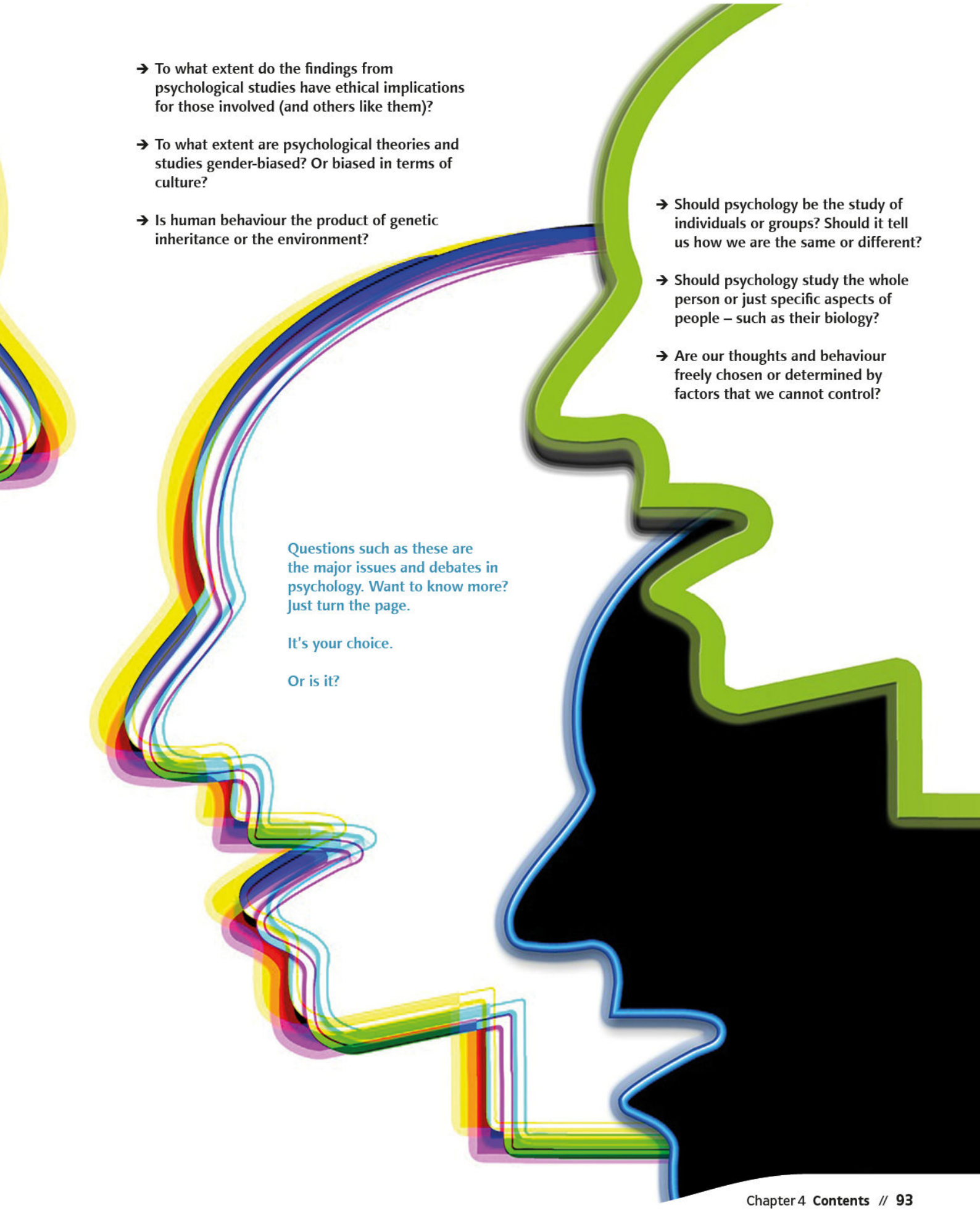
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- To what extent do the findings from psychological studies have ethical implications for those involved (and others like them)?
- To what extent are psychological theories and studies gender-biased? Or biased in terms of culture?
- Is human behaviour the product of genetic inheritance or the environment?
- Should psychology be the study of individuals or groups? Should it tell us how we are the same or different?
- Should psychology study the whole person or just specific aspects of people – such as their biology?
- Are our thoughts and behaviour freely chosen or determined by factors that we cannot control?



Questions such as these are the major issues and debates in psychology. Want to know more? Just turn the page.

It's your choice.

Or is it?

Gender and culture in Psychology: Gender bias

The specification says...

Gender and culture in Psychology – universality and bias. Gender bias including androcentrism and alpha and beta bias.

'The representation of the world, like the world itself, is the work of men; they describe it from their own point of view, which they confuse with the truth' – Simone De Beauvoir (1949).

Historically, psychology has been a male-dominated discipline and if the female voice has been heard at all, it has been minimised, marginalised or judged as 'abnormal' against the male standard.

Key terms

Universality Any underlying characteristic of human beings that is capable of being applied to all, despite differences of experience and upbringing. Gender bias and culture bias threaten the universality of findings in psychology.

Gender bias When considering human behaviour, bias is a tendency to treat one individual or group in a different way from others. In the context of gender bias, psychological research or theory may offer a view that does not justifiably represent the experience and behaviour of men or women (usually women).

Androcentrism Male-centred, when 'normal' behaviour is judged according to a male standard (meaning that female behaviour is often judged to be 'abnormal' or 'deficient' by comparison).

Alpha bias Research that focuses on differences between men and women, and therefore tends to present a view that exaggerates these differences.

Beta bias Research that focuses on similarities between men and women, and therefore tends to present a view that ignores or minimises differences.

Apply it Concepts

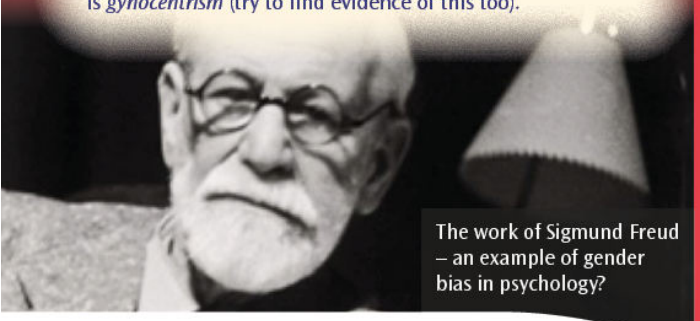
DIY content analysis

Go through the topics you have studied in Year 1 and Year 2 and try to find examples of gender-biased research (theories and studies).

Task

For any research you identify, explain why it shows evidence of alpha bias, beta bias and/or androcentrism.

Note that not all examples of gender bias in psychology exhibit a male bias. The female equivalent of androcentrism is *gynocentrism* (try to find evidence of this too).



The work of Sigmund Freud – an example of gender bias in psychology?

The issue of gender bias

Universality and bias

Psychologists – like everyone – hold beliefs and values that have been influenced by the social and historical context within which they live. These beliefs may be biased, that is leaning towards a subjective view that does not necessarily reflect objective reality.

This means bias in the research process may be inevitable, despite psychologists' claims about discovering 'facts' that are 'objective' and 'value-free'. Bias also undermines psychology's claims to **universality** – that conclusions drawn can be applied to everyone, anywhere, regardless of time or culture.

On this spread we look at **gender bias** which comes in two forms – **alpha bias** and **beta bias**.

Alpha bias

Psychological research that exaggerates differences is alpha-biased. Such differences are typically presented as fixed and inevitable. Sometimes these differences heighten the value of women, but more often they devalue women in relation to men.

The classic example of alpha bias is Freud's (1905) theory of psychosexual development (see pages 18 and 160). During the **phallic stage** of development both boys and girls develop a desire for their opposite-gender parent. In a boy this creates a very strong **castration anxiety** (fear his father will cut his penis off). The anxiety is resolved when the boy identifies with his father. But a girl's eventual identification with her same-gender parent is weaker, which means her **Superego** is weaker (because it develops as a result of taking on the same-gender parent's moral perspective). Therefore girls/women are morally inferior to boys/men.

Alpha bias can sometimes favour women in the psychodynamic approach. Nancy Chodorow (1968) suggested that daughters and mothers have a greater connectedness than sons and mothers because of biological similarities. As a result of the child's closeness, women develop better abilities to bond with others and empathise.

Beta bias

Psychological research that ignores or underestimates differences is beta-biased. This happens when we assume that research findings apply equally to both men and women even when women have been excluded from the research process.

One example of beta bias is research on the **fight or flight** response. Biological research has generally favoured using male animals because female behaviour is affected by regular hormonal changes due to ovulation. This simply ignores any possible differences. Early research into fight or flight did just that – it assumed that both males and females respond to threatening situations with fight or flight.

More recently, Shelley Taylor *et al.* (2000) claimed that this is not true and described the **tend and befriend** response. The 'love' hormone **oxytocin** is more plentiful in women (but present in smaller quantities in men) and it seems that women respond to stress by increasing oxytocin production. This reduces the fight or flight response and enhances a preference for 'tend and befriend' (an evolved response for looking after others). (See page 278 for more details.)

This illustrates how research that minimises gender differences may result in a misrepresentation of women's behaviour. Other research has misrepresented men. For example in your Year 1 studies you looked at research on attachment that assumed emotional care is provided solely by mothers. But research on the role of fathers shows that fathers can supply the emotional care often assumed to be the province of women.

Androcentrism

Alpha bias and beta bias are consequences of **androcentrism**. Over the years, psychology has presented a male-dominated version of the world. For example, the American Psychological Association published a list of the 100 most influential psychologists of the 20th Century which included only six women. This suggests that psychology has traditionally been a subject produced by men, for men and about men – an androcentric perspective.

Women's behaviour, if it has been considered, has been misunderstood, and at worst, pathologised – taken as a sign of illness. Feminists have objected to the diagnostic category *premenstrual syndrome*, for example, on the grounds that is medicalises women's emotions, such as anger, by explaining these in hormonal terms. Men's anger, in contrast, is often seen as a rational response to external pressures (Brescoll and Uhlmann 2008).

Evaluation

Biological versus social explanations

One limitation is that gender differences are often presented as fixed and enduring (i.e. alpha bias) when they are not.

Eleanor Maccoby and Carol Jacklin (1974) presented the findings of several gender studies which concluded that girls have superior verbal ability whereas boys have better spatial ability. Maccoby and Jacklin suggested that these differences are 'hardwired' into the brain before birth. Such findings become widely reported and seen as facts. In fact Daphna Joel *et al.* (2015) used brain scanning and found no such sex differences in brain structure or processing. It is possible that the data from Maccoby and Jacklin was popularised because it fitted existing stereotypes of girls as 'speakers' and boys as 'doers'.

This suggests that we should be wary of accepting research findings as biological facts when they might be explained better as social stereotypes.

Counterpoint However, this does not mean that psychologists should avoid studying possible gender differences in the brain. For instance, research by Madura Ingalhalikar *et al.* (2014) suggests that the popular social stereotype that women are better at multitasking may have some biological truth to it. It seems that a woman's brain may benefit from better connections between the right and the left hemisphere than in a man's brain (research on gender stereotypes is discussed on page 149).

This suggests that there may be biological differences but we still should be wary of exaggerating the effect they may have on behaviour.

Sexism in research

Another limitation is that gender bias promotes sexism in the research process.

Women remain underrepresented in university departments, particularly in science. Although psychology's undergraduate intake is mainly of women, lecturers in psychology departments are more likely to be men (Murphy *et al.* 2014). This means research is more likely to be conducted by men and this may disadvantage participants who are women. For example, a male researcher may expect women to be irrational and unable to complete complex tasks (Nicolson 1995) and such expectations are likely to mean that women underperform in research studies.

This means that the institutional structures and methods of psychology may produce findings that are gender-biased.

Gender-biased research

A further limitation is that research challenging gender biases may not be published.

Magdalena Formanowicz *et al.* (2018) analysed more than 1000 articles relating to gender bias, published over eight years. They found that research on gender bias is funded less often and is published by less prestigious journals. The consequence of this is that fewer scholars become aware of it or apply it within their own work. The researchers argued that this still held true when gender bias was compared with other forms of bias, such as ethnic bias, and when other factors were controlled, such as the gender of the author(s) and the methodology used.

This suggests that gender bias in psychological research may not be taken as seriously as other forms of bias.

Evaluation eXtra

Understanding bias

Gender-biased research may create misleading assumptions about female behaviour, fail to challenge negative stereotypes and validate discriminatory practices. In any domain in which men set the standard of normalcy, as Carol Tavris (1993) puts it, 'it becomes normal for women to feel abnormal'. Thus, gender bias in research is not just a methodological problem but may have damaging consequences which affect the lives and prospects of real women.

That said, many modern researchers now recognise the effect their own values and assumptions have on the nature of their work (known as *reflexivity*). Rather than seeing such bias as a problem that may threaten the objective status of their work, they embrace it as a crucial aspect of the research process. For instance, in their study of the lack of women in executive positions in accountancy firms, Claire Dambrin and Caroline Lambert (2008) include reflection on how their gender-related experiences influence their reading of events.

Consider: *Is gender bias a good or a bad thing?*

Apply it
Concepts

Ethnographic research

In recent decades, a number of researchers have described the so-called 'turn to language' in psychology (e.g. Potter and Wetherall 1995). This signifies less of a reliance on the traditional laboratory experiment and more focus on collaborative, qualitative methods, such as interview techniques. This is an important feature of *ethnography* – the study of social life and culture.

Ethnographic research strives to give participants a 'voice', enabling those studied to genuinely participate in research, rather than being objects of study. This allows diversity within groups to be investigated, rather than comparisons made between, say, women and men.

Question

Explain how ethnographic research challenges gender bias in psychological research.



We find it difficult to remember whether alpha or beta bias stands for 'exaggerated' – try thinking of the Big Apple.

Apply it
Methods

Social influence research

A psychologist conducted a content analysis of 20 studies in social psychology from the 1960s and 70s and concluded that the majority of these showed clear evidence of alpha bias.

Questions

1. Explain how the psychologist may have carried out this **content analysis**. Refer to **coding** and/or **thematic analysis** in your answer. (*6 marks*)
2. Are the results an example of **primary** or **secondary data**? Explain your answer. (*3 marks*)

Check it

1. Outline what is meant by 'androcentrism' in psychological research. *[2 marks]*
2. Describe **one** example of psychological research that demonstrates alpha bias. *[4 marks]*
3. Describe **one** example of psychological research that demonstrates beta bias. *[4 marks]*
4. Discuss gender bias in psychological research. *[16 marks]*

Gender and culture in Psychology: Cultural bias

The specification says...

Gender and culture in Psychology – universality and bias. Cultural bias, including ethnocentrism and cultural relativism.

The charge is that psychological research has often ignored differences between cultures and developed theories almost entirely based on the study of one culture alone – the United States.

Key terms

Cultural bias A tendency to interpret all phenomena through the 'lens' of one's own culture, ignoring the effects that cultural differences might have on behaviour.

Ethnocentrism Judging other cultures by the standards and values of one's own culture. In its extreme form it is the belief in the superiority of one's own culture which may lead to prejudice and discrimination towards other cultures.

Cultural relativism The idea that norms and values, as well as ethics and moral standards, can only be meaningful and understood within specific social and cultural contexts.

Study tip

Cultural difference versus cultural bias.

Don't confuse the two. We would expect to observe basic *cultural differences* in behaviour from society to society, culture to culture, as different norms and values influence the way people think and behave in different places (such as the difference in cultural levels of conformity – see first evaluation point on the facing page).

The argument, however, is that psychology, in some areas of research particularly, has ignored or misinterpreted differences between cultures and imposed an understanding based on the study of one culture alone – this is cultural bias.



Only five minutes to go! But would the idea of testing intelligence against the clock be regarded as peculiar in some cultures?

Cultural bias

Universality and bias (revisited)

On the previous spread we considered **universality** and bias related to gender, and reported that psychology has been dominated by men and has made assumptions about human behaviour largely based on male behaviour. A similar issue arises with respect to culture.

Joseph Henrich *et al.* (2010) reviewed hundreds of studies in leading psychology journals and found that 68% of research participants came from the United States, and 96% from industrialised nations. Another review found that 80% of research participants were undergraduates studying psychology (Arnett 2008).

Such findings suggest that what we know about human behaviour has a strong **cultural bias**. Psychologists routinely claim to have discovered 'facts' about universal human behaviour. Henrich *et al.* coined the term WEIRD to describe the group of people most likely to be studied by psychologists – Westernised, Educated people from Industrialised, Rich Democracies.

If the norm or standard for a particular behaviour is set by WEIRD people, then the behaviour of people from non-Westernised, less educated, agricultural and poorer cultures is inevitably seen as 'abnormal', 'inferior' or 'unusual'.

Ethnocentrism

Ethnocentrism refers to a particular form of cultural bias and is a belief in the superiority of one's own cultural group. The position described above suggests that people from the US and Europe have presented an ethnocentric view of human behaviour.

Mary Ainsworth and Silvia Bell's (1970) **Strange Situation** is an example of this, criticised as reflecting only the norms and values of what is sometimes called 'Western' culture. They conducted research on **attachment** type, suggesting that 'ideal' attachment was characterised by the babies showing moderate amounts of distress when left alone by their mother-figure (typical of **secure attachment**). However, this led to misinterpretation of child-rearing practices in other countries which were seen to deviate from the American 'norm'. For example Japanese infants were much more likely to be classed as insecurely attached because they showed considerable distress on separation (Takahashi 1986). It is likely that this finding was due to the fact that Japanese babies are rarely separated from their mother.

Cultural relativism

John Berry (1969) has drawn a distinction between *etic* and *emic* approaches in the study of human behaviour. An etic approach looks at behaviour from *outside* of a given culture and attempts to describe those behaviours as universal. An emic approach functions from *inside* a culture and identifies behaviours that are *specific* to that culture.

Ainsworth and Bell's research is an example of an **imposed etic** – they studied behaviour inside one culture (America) and then assumed their ideal attachment type (and the method for assessing it) could be applied universally. Another example of an imposed etic can be considered in relation to how we define abnormality, see Apply it 'Cultural bias in definitions of abnormality' (facing page).

Berry argues that psychology has often been guilty of an imposed etic approach – arguing that theories, models, concepts, etc., are universal, when they actually came about through emic research inside a single culture. The suggestion is that psychologists should be much more mindful of the **cultural relativism** of their research – that the 'things' they discover may only make sense from the perspective of the culture within which they were discovered – and being able to recognise this is one way of avoiding cultural bias in research.

Apply it
Concepts

Ethnocentric intelligence testing

Richard Brislin (1976) cites intelligence tests as an illustration of the concepts of ethnocentrism and imposed etic. Such tests often involve completing tasks 'against the clock'. However, Brislin asks about the validity of this notion of 'mental quickness' in relation to intelligence. The Baganda people of Uganda characterise intelligence as slow, careful and deliberate thought (Wober 1974). They might view 'speed of thought' as thoughtlessness or rashness.

Question

Explain why culturally biased intelligence tests may lead to ethnic stereotyping and discrimination against particular groups in society.

Evaluation

Classic studies

One limitation is that many of the most influential studies in psychology are culturally-biased.

Cultural bias is a feature of many classic studies of social influence. For instance, both Asch's and Milgram's original studies were conducted exclusively with US participants (most of whom were white, middle-class students). Replications of these studies in different countries produced rather different results. For instance, Asch-type experiments in **collectivist** cultures found significantly higher rates of conformity than the original studies in the US, an **individualist** culture (e.g. Smith and Bond 1993).

This suggests our understanding of topics such as social influence should only be applied to individualist cultures.

Counterpoint However, in an age of increased media globalisation, it is argued that the individualist–collectivist distinction no longer applies. The traditional argument is that individualist countries (such as the US) value individuals and independence, whilst collectivist cultures/countries, such as India and China, value society and the needs of the group. However, Yohtaro Takano and Eiko Osaka (1999) found that 14 out of 15 studies that compared the US and Japan found no evidence of individualism or collectivism – describing the distinction as lazy and simplistic.

This suggests that cultural bias in research may be less of an issue in more recent psychological research.

Cultural psychology

One strength is the emergence of cultural psychology.

Cultural (sometimes multicultural) psychology is, according to Dov Cohen (2017), the study of how people shape and are shaped by their cultural experience. This is an emerging field and incorporates work from researchers in other disciplines including anthropology, sociology and political science. Cultural psychologists strive to avoid ethnocentric assumptions by taking an emic approach and conducting research from inside a culture, often alongside local researchers using culturally-based techniques. Cross-cultural research tends to focus on just two cultures instead of larger scale studies with maybe eight or more countries/cultures.

This suggests that modern psychologists are mindful of the dangers of cultural bias and are taking steps to avoid it.

Ethnic stereotyping

One limitation of cultural bias in psychology is it has led to prejudice against groups of people.

Stephen Jay Gould (1981) explained how the first intelligence tests led to **eugenic** social policies in the US. Psychologists used the opportunity of World War I to pilot their first IQ tests on 1.75 million army recruits. Many of the items on the test were ethnocentric, for example assuming everyone would know the names of the US presidents. The result was that recruits from south-eastern Europe and African-Americans received the lowest scores. The poor performance of these groups was not taken as a sign of the test's inadequacy but was instead used to inform racist discourse about the genetic inferiority of particular cultural and ethnic groups. Ethnic minorities were deemed 'mentally unfit' and 'feeble-minded' in comparison to the white majority and were denied educational and professional opportunities as a result.

This illustrates how cultural bias can be used to justify prejudice and discrimination towards certain cultural and ethnic groups.

Evaluation eXtra

Relativism versus universality

One of the great benefits of conducting cross-cultural research is that it may challenge dominant individualist ways of thinking and viewing the world. Being able to see that some of the knowledge and concepts we take for granted are not hardwired (i.e. social rather than biological) may provide a better understanding of human nature.

However, it should not be assumed that *all* psychology is culturally relative and that there is no such thing as universal human behaviour. Research (e.g. Ekman 1989) suggests that basic facial expressions for emotions (such as happiness or disgust) are the same all over the human and animal world. Criticisms of attachment research should not obscure the fact that some features of human attachment (such as imitation and **interactional synchrony**) are universal.

Consider: *Which approach reveals more about human nature?*



Are our ideas about mental health based on the perspective of more individualist cultures?

Apply it
Concepts

Cultural bias in definitions of abnormality

Harriet Lefley and Paul Pedersen (1986) argued that European/American ideas about what it means to be mentally healthy are not necessarily shared by the rest of the world. Clinicians in the US and Europe have generally regarded characteristics such as self-sufficiency, independence, goal-orientated behaviour and an internal locus of control as indicators of mental health.

In contrast, individuals who demonstrate dependence on others and an external locus of control are often seen as less healthy, even though these characteristics might be perceived more positively in other parts of the world.

Questions

1. The topic of psychopathology was covered in Chapter 5 of our Year 1 book, where four definitions of abnormality were discussed. Which of these are Lefley and Pedersen's comments most relevant to?
2. Which definitions of abnormality may only apply to individualist cultures such as Europe/US?

Apply it
Methods

Professor Emic

Professor Emic wants to conduct cross-cultural research with a remote non-industrialised community that has had very limited contact with the wider world. The professor is keen to investigate levels of conformity among the community and intends to replicate the Asch line-matching study (in our Year 1 book) with some of the members of the community.

Question

Discuss some of the potential methodological issues of **replicating** the Asch study with the remote community. (*6 marks*)

Check it

1. Outline what is meant by 'cultural bias' in psychology. *[3 marks]*
2. Describe **one** example of ethnocentrism in psychology. *[4 marks]*
3. Discuss cultural bias in psychology. Refer to examples in your answer. *[16 marks]*

Free will and determinism

The specification says...

> Free will and determinism: hard determinism and soft determinism; biological, environmental and psychic determinism. The scientific emphasis on causal explanations.

Coming to this debate for the first time, students are often puzzled by the idea of determinism – the view that our thoughts and behaviour are influenced by forces beyond our control. Our everyday experience would seem to suggest that what we do and think is a matter of choice and within our conscious control (free will). Surely what you are wearing today, what you have eaten, and your decision to pick up this book were all choices you freely made.

Despite this, most psychologists accept the role of determinism in behaviour to some degree – though, as we shall see, there is disagreement surrounding the exact form this determinism might take.

Key terms

Free will The notion that humans can make choices and their behaviour/thoughts are not determined by biological or external forces.

Determinism The view that an individual's behaviour is shaped or controlled by internal or external forces rather than an individual's will to do something.

Hard determinism The view that all behaviour is caused by something (internal or external factors), so free will is an illusion.

Soft determinism The view that behaviour may be predictable (caused by internal/external factors) but there is also room for personal choice from a limited range of possibilities (restricted free will).

Biological determinism The belief that behaviour is caused by biological (genetic, hormonal, evolutionary) influences that we cannot control.

Environmental determinism The belief that behaviour is caused by features of the environment (such as systems of reward and punishment) that we cannot control.

Psychic determinism The belief that behaviour is caused by unconscious psychodynamic conflicts that we cannot control.



A fortune teller attempts to predict the future . . . but will complete prediction ever be possible?

The free will–determinism debate

The **free will–determinism** debate asks a simple question – is our behaviour a matter of free will (i.e. selected without constraint) or are we the product of a set of internal and/or external influences that determine who we are and what we do?

Most approaches in psychology are determinist to some extent. However, the different approaches disagree on what the precise causes of human behaviour are. For example the **biological approach** suggests the causes are internal (could be **nature** or **nurture**) whereas the **behaviourist approach** suggests they are external. The **humanistic approach** embraces the concept of free will. See the discussion on page 20.

Key concepts of the debate

Free will

The notion of free will suggests that human beings are essentially self-determining and free to choose their own thoughts and actions. A belief in free will does not deny that there may be biological and environmental forces that exert some influence on behaviour, but nevertheless implies that we are able to reject these forces if we wish because we are in control of our thoughts/behaviour. Free will is a view of human behaviour that is advocated by the humanistic approach (see Apply it, facing page).

Determinism

In contrast determinism proposes that free will has no place in explaining behaviour, though there are hard and soft versions.

Hard determinism This is sometimes referred to as *fatalism*, and suggests that all human behaviour has a cause, and, in principle, it should be possible to identify and describe these causes. Such a position always assumes that everything we think and do is dictated by internal or external forces that we cannot control. For some, however, this is too extreme a position.

Soft determinism The philosopher William James (1890) was the first to put forward the notion of soft determinism – a position that later became an important feature of the **cognitive approach**. James thought that, whilst it may be the job of scientists to explain what *determines* our behaviour, this does not detract from the freedom we have to make rational conscious choices in everyday situations.

Types of determinism

Biological determinism The biological approach emphasises the role of biological determinism in behaviour, such as the influence of the **autonomic nervous system** on the stress response (see page 35) or the influence of genes on mental health. Modern biological psychologists would recognise the mediating influence of the environment on our biological structures (another determinist influence).

Environmental determinism B.F. Skinner described free will as 'an illusion' and argued that all behaviour is the result of **conditioning**. Although we might think we are acting independently, our experience of 'choice' is merely the sum total of reinforcement contingencies that have acted upon us throughout our lives.

Psychic determinism Sigmund Freud also believed that free will is an 'illusion' but he emphasised the influence of biological drives and instincts. He saw human behaviour as determined by unconscious conflicts, **repressed** in childhood. There is no such thing as an accident, according to Freud, and even something as seemingly random as a 'slip of the tongue' can be explained by the influence of the unconscious.

The scientific emphasis on causal explanations

One of the basic principles of science is that every event in the universe has a cause and that causes can be explained using general laws (hard determinism). Knowledge of causes and the formulation of laws are important as they allow scientists to predict and control events in the future.

In psychology, the **lab experiment** is the ideal of science as it enables researchers to demonstrate causal relationships – it is like the test tube used in other sciences where all variables can be controlled.

Apply it

Methods The scientific approach

In its search for causal laws, scientific psychology adopts a determinist approach to the study of human behaviour.

Questions

1. Explain why science is determinist. Refer to the features of science in your answer. (*8 marks*)
2. Explain why the idea of free will would seem to be incompatible with the aims of science. (*4 marks*)

Evaluation

Practical activity on page 108

Practical value

One strength of free will (rather than determinism) is its practical value.

The common-sense view is that we exercise free choice in our everyday lives on a daily basis. However, even if this is not the case, *thinking* we do exercise free choice can improve our mental health. A study by Rebecca Roberts *et al.* (2000) looked at adolescents who had a strong belief in fatalism – that their lives were 'decided' by events outside of their control. The study found that these adolescents were at **significantly** greater risk of developing **depression**. It seems that people who exhibit an external, rather than internal, **locus of control** are less likely to be optimistic.

This suggests that, even if we do not have free will, the fact that we believe we do may have a positive impact on mind and behaviour.

Research evidence

One limitation of free will is that brain scan evidence does not support it but does support determinism.

Benjamin Libet *et al.* (1983) instructed participants to choose a random moment to flick their wrist while he measured activity in their brain ('readiness potential'). Participants had to say when they felt the conscious will to move. Libet found that the *unconscious* brain activity leading up to the conscious decision to move came around half a second *before* the participant consciously felt they had decided to move.

This may be interpreted as meaning that even our most basic experiences of free will are actually determined by our brain before we are aware of them (a thought that could keep you awake at night if you dwell on it!).

Counterpoint However, Libet's findings showing that the brain is involved in decision-making is not surprising and is, in fact, just as we would expect. Just because the action comes before the conscious awareness of the decision to act, doesn't mean that there was no decision to act – just that the decision to act took time to reach consciousness. Our conscious awareness of the decision is simply a 'read-out' of our unconscious decision-making.

This suggests this evidence is not appropriate as a challenge to free will.

The law

One limitation of determinism (and strength of free will) is the position of the legal system on responsibility.

The hard determinist stance is that individual choice is not the cause of behaviour. This is not consistent with the way in which our legal system operates. In a court of law, offenders are held responsible for their actions. Indeed, the main principle of our legal system is that a defendant exercised their free will in committing the crime (see top right).

This suggests that, in the real world, determinist arguments do not work.

Evaluation eXtra

Do we want determinism?

Determinist approaches helped establish psychology as a science. In addition, hard determinism (such as the biological and behaviourist approaches) has produced many effective real-world applications. These include therapies and behavioural interventions.

However, free will has intuitive appeal. Most of us see ourselves as making our own choices rather than being 'pushed' by forces we cannot control. Free will may also be liberating for some people in terms of 'not accepting one's fate' – if they come from a criminal background or there is mental disorder in their family, for instance.

Consider: *Which of the two approaches should psychology pursue?*

Apply it Concepts

Free will and the law

Determinism is incompatible with our notions of legal responsibility, that criminals are held to be personally and morally accountable for their actions. Very few individuals would represent themselves in court by trying to appeal to a judge and jury that their offence was biologically, environmentally or psychically determined!

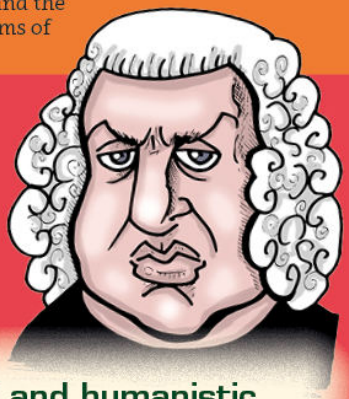
Only in extreme circumstances are juries instructed to act with greater leniency – for instance, when the *Law of Diminished Responsibility* is applied. This comes into play when, for various reasons, a defendant is assumed not to have acted in accordance with their own free will, for example, in cases of self-defence, psychological disorders and so-called 'crimes of passion' (when a judgement of temporary insanity may be made).

Question

Having said that, there are precedents for the legal defence of biological determinism. Turn to page 329 and read about the cases of Stephen Mobley and Abdelmalek Bayout. What are the implications of these cases for the future of the legal system and our understanding of criminal responsibility?

Study tip

The specification does not identify a free will-determinism *debate* but it is classed as a debate (as this chapter is called 'Issues and debates'). The same applies to idiographic-nomothetic and holism-reductionism – all three are concerned with two competing approaches in psychology, and the question is 'which one is better?' in terms of how it represents human nature.



In the 18th Century, writer Samuel Johnson famously said, 'Sir, we know our will is free, and there's an end to it.' Nothing is so simple any more.

Apply it Concepts

Free will and humanistic psychology

The humanistic approach is one of the few to adopt a free will perspective on behaviour. The concept was central to Rogers' client-centred therapy in that people are seen as being free to effect change in their lives by choosing to see their situation differently. Having removed the psychological barriers that may be preventing personal growth, people are free to work towards their potential (self-actualisation).

Question

Explain how Rogers' approach to **client-centred therapy** illustrates his belief in free will. Refer to **humanistic** concepts such as **conditions of worth** and **congruence** in your answer.

Check it

1. Explain the difference between free will and determinism. *[4 marks]*
2. Explain what is meant by 'soft determinism'. *[2 marks]*
3. Briefly explain the concept of biological determinism. *[2 marks]*
4. Discuss the free will and determinism debate. Refer to **two** topics you have studied in psychology in your answer. *[16 marks]*

The nature–nurture debate

The specification says...

The nature–nurture debate: the relative importance of heredity and environment in determining behaviour; the interactionist approach.

The nature versus nurture debate has a long history in psychology – the question whether behaviours (personality, mental disorder etc) are caused by innate factors (nature) or learning/experience (nurture). Recent research, however, has been more concerned with explanations of how nature and nurture *interact*, i.e. influence each other.

Key terms

The nature–nurture debate Concerned with the extent to which aspects of behaviour are a product of inherited or acquired characteristics.

Heredity The genetic transmission of both mental and physical characteristics from one generation to another.

Environment Any influence on human behaviour that is non-genetic. This may range from prenatal influences in the womb through to cultural and historical influences at a societal level. It includes biological influences, e.g. the food you eat may affect your mental development and physical growth.

Interactionist approach A way to explain the development of behaviour in terms of a range of factors, including both biological and psychological ones. Most importantly such factors don't simply add together but combine in a way that can't be predicted by each one separately i.e. they interact.



Of course smoking is bad for you – but could it also be bad for your grandchildren?

The nature–nurture debate

The interactionist approach

The **nature–nurture debate** seeks to answer the question of whether our behaviour is more influenced by **nature** or **nurture**. It is not really a 'debate' about one or the other because any behaviour/characteristic arises from a combination of both – even something as simple as eye colour is not completely determined by your **genes** (eye colour is about .80 **heritable**, Bräuer and Chopra 1978).

For example, John Bowlby (1958) claimed that a baby's **attachment type** is determined by the warmth and continuity of parental love (an environmental influence). Jerome Kagan (1984) proposed that a baby's innate personality (temperament) also affects the attachment relationship. Thus, nature (the child's temperament), in a real sense, *creates* nurture (the parents' response), so **environment** and **heredity** interact.

For this reason, psychologists are now more likely to ask what the *relative contribution* of each influence is. Therefore, the nature–nurture debate is really about discussing how nature and nurture interact – an **interactionist approach**.

Diathesis-stress model

The **diathesis-stress model** suggests behaviour is caused by a biological or environmental vulnerability (diathesis) which is only expressed when coupled with a biological or environmental 'trigger' (**stressor**). For example, you studied biological explanations of **OCD** in Year 1. A person who inherits a genetic vulnerability for OCD may not develop the disorder. But, combined with a psychological trigger (e.g. a traumatic experience) this may result in the disorder appearing.

Epigenetics

Epigenetics refers to a change in our genetic activity without changing the genes themselves. It is a process that happens throughout life and is caused by interaction with the environment. Aspects of our lifestyle or events we encounter (from smoking and diet to trauma and war) leave 'marks' on our DNA (genes), which switch genes on or off. This explains why factors such as smoking have a lifelong influence even after you actually stop – they have changed the way your genes will be expressed.

Even more remarkably these epigenetic changes may go on and influence the genetic codes of our children, as well as their children. Epigenetics therefore introduces a third element into the nature–nurture debate – the life experience of previous generations.

Key concepts of the debate

Nature

Nature refers to inherited influences, or heredity. Early nativists such as René Descartes (1596–1650) argued that all human characteristics – and even some aspects of knowledge – are innate. Psychological characteristics like intelligence or personality are determined by biological factors (genes), just as physical characteristics like eye colour or height are.

Nurture

Nurture refers to the influence of experience and the environment. **Empiricists** including the philosopher John Locke (1632–1704) argued that the mind is a *blank slate* at birth (in Latin, *tabula rasa*), which is then shaped by the environment. This view later became an important feature of the **behaviourist approach**.

Richard Lerner (1986) has identified different *levels of the environment*. This includes prenatal factors, such as how physical influences (smoking) or psychological influences (music) affect a foetus. More generally development is influenced postnatally in terms, for example, of the social conditions a child grows up in.

Measuring nature and nurture

The degree to which two people are similar on a particular trait can be represented by a **correlation coefficient** and is called **concordance**. Such concordance provides an estimate about the extent to which a trait is inherited – called **heritability**. Heritability is the proportion of differences between individuals in a population, with regards to a particular trait, that is due to genetic variation. A figure of .01 (or 1%) means genes contribute almost nothing to individual differences and 1.0 (or 100%) means genes are the only reason for individual differences.

The general figure for heritability in **IQ** is about .5 across multiple studies in varying populations (Plomin 1994). This means that about half of a person's intelligence is determined by genetic factors and the other half must be environmental.

Apply it Concepts

The nature–nurture debate

The continuum from nature to nurture is illustrated below.

Nature		Interactionist		Nurture
Focus on heredity, hormones and chemicals, though interaction with the environment is acknowledged.	Basic instincts (e.g. sex, aggression) drive behaviour but relationship with parents also important.	Innate information processing abilities are constantly refined by experience.	Basic physiological needs but the focus is on the person's experience of their own environment.	The mind is a blank slate at birth. Behaviour is determined by learning experiences.

Question

Match the following approaches with the correct description on the continuum:

- behaviourist
- cognitive
- biological
- psychodynamic
- humanistic

Practical activity on page 109

Evaluation

Adoption studies

One strength of research into the nature–nurture debate is the use of adoption studies.

Adoption studies are useful because they separate the competing influences of nature and nurture. If adopted children are found to be more similar to their adoptive parents, this suggests the environment is the bigger influence. Whereas, if adopted children are more similar to their biological parents (no influence on their environment), then genetic factors are presumed to dominate. A **meta-analysis** of adoption studies by Soo Rhee and Irwin Waldman (2002) found that genetic influences accounted for 41% of the variance in aggression (see page 294).

This shows how research can separate the influences of nature and nurture.

Counterpoint However, research suggests that this approach may be misguided, that nature and nurture are not two entities that can simply be pulled apart. According to Robert Plomin (1994) people create their own 'nurture' by actively selecting environments that are appropriate for their 'nature'. Thus, a naturally aggressive child is likely to feel more comfortable with children who show similar behaviours and will 'choose' their environment accordingly. Then, their chosen companions further influence their development. Plomin refers to this as *niche-picking*.

This suggests that it does not make sense to look at evidence of either nature or nurture.

Epigenetics

Another strength of the debate is support for epigenetics.

One example of how environmental effects can span generations presumably through epigenetic effects comes from events of the Second World War. In 1944, the Nazis blocked the distribution of food to the Dutch people and 22,000 died of starvation, in what became called the *Dutch Hunger Winter*. Ezra Susser and Shang Lin (1992) report that women who became pregnant during the famine went on to have low birth weight babies. Whilst this may be unsurprising, what is more interesting is that these babies were twice as likely to develop **schizophrenia** when they grew up compared to more typical population rates.

This supports the view that the life experiences of previous generations can leave epigenetic 'markers' that influence the health of their offspring.

Real-world application

A further strength of the nature–nurture debate is that it has real-world application.

Research suggests that OCD is a highly heritable mental disorder. For example Gerald Nestadt *et al.* (2010) put the heritability rate at .76. Such understanding can inform *genetic counselling* because it is important to understand that high heritability does not mean it is inevitable that the individual will go on to develop the disorder. This means that people who have a high genetic risk of OCD because of their family background can receive advice about the likelihood of developing the disorder and how they might prevent this (e.g. learn to manage stress).

This shows that the debate is not just a theoretical one but that it is important, at a practical level, to understand the interaction between nature and nurture.

Evaluation eXtra

Implications of the debate

Nativists suggest that 'anatomy is destiny' in that our genetic make-up *determines* our characteristics and behaviour, with little environmental input. This extreme **determinist** stance has led to controversy, such as linking ethnicity, genetics and intelligence and the application of eugenic policies (as discussed on page 97 – see evaluation point on ethnic stereotyping).

In contrast – but also controversially – empiricists suggest that any behaviour can be changed by altering environmental conditions. **Behaviour shaping**, a behaviourist concept, has had practical application in therapy. Desirable behaviours are selectively reinforced, and undesirable behaviours are punished or ignored (see 'Aversion therapy' on page 370). Carried to an extreme this could lead to complete social control by the state for the 'good' of everyone (as described in *Walden Two*, see right).

Consider: *Is one side of the debate potentially more dangerous than the other?*

Apply it Methods — Is voting in the genes?

Researchers Norma Nature and Neville Nurture wanted to see whether voting behaviour in a general election was genetically determined. They gathered together a sample of 10 twins. The researchers assumed that all the twins in the sample were identical (monozygotic) because they looked alike.

Each twin was interviewed and the political party they voted for in the 2019 General Election was recorded. It was found that half of the twin pairs in the sample voted for the same political party as their sibling, and the other half did not.

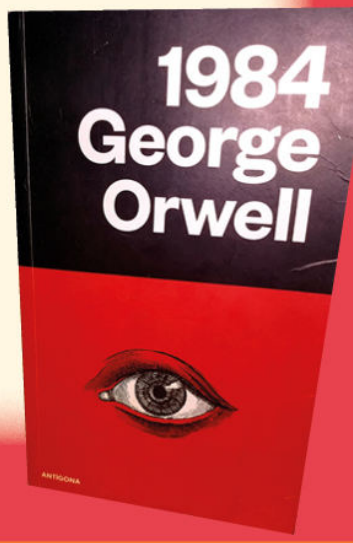
Nature and Nurture concluded that their investigation was strong evidence for the idea that voting behaviour has a genetic basis. The researchers wrote up their findings and submitted the completed article for peer review.

Question

Imagine you are **peer reviewing** this research. Discuss the methodological limitations of Nature and Nurture's investigation into the genetic basis of voting behaviour. (*8 marks*)

Apply it Concepts — 1984 and Walden Two

George Orwell's novel *1984* (published in 1949) presents a chilling dystopian vision of the future (as it was then!) in which society is an authoritarian state controlled and manipulated by a malevolent force: 'Big Brother'. In 1948, B.F. Skinner's novel *Walden Two* was published which explores similar themes of social control. However, Skinner presented his society as a 'utopian' ideal in which human beings are reinforced and 'shaped' towards their potential.



Question

Despite their differences, how are both these books based on an **empiricist** approach to the nature–nurture debate?

Study tip

A mistake that is sometimes made when discussing this debate, or indeed any debate, is to refer to one side of the debate as 'the debate'. You should avoid using the phrases 'the nature debate' or 'the nurture debate'. If you are discussing just one side of the debate, call it, for example, 'the nature approach' or 'the nurture perspective' and then it's clear what you mean!

Check it

1. Explain what is meant by 'heredity'. *[2 marks]*
2. Briefly outline the nature–nurture debate in psychology. *[4 marks]*
3. Explain what is meant by an 'interactionist approach' in the nature–nurture debate. *[4 marks]*
4. Discuss the nature–nurture debate. Refer to **at least one** topic you have studied in psychology in your answer. *[16 marks]*

Holism and reductionism

The specification says...

Holism and reductionism: levels of explanation in psychology. Biological reductionism and environmental (stimulus–response) reductionism.

In attempting to understand a work of art we might focus on how the painting was produced (the kind of paints that were used, the individual brushstrokes, etc.). But this will tell us very little about the meaning of the whole painting. A similar issue concerns psychologists, some of whom feel that knowing about the parts may be useful to biologists but psychologists should be concerned with the meaning of the whole.

Key terms

Holism An argument or theory which proposes that it only makes sense to study an indivisible system rather than its constituent parts (which is the reductionist approach).

Reductionism The belief that human behaviour is best understood by studying the smaller constituent parts.

Levels of explanation The idea that there are several ways (levels) that can be used to explain behaviour. The lowest level considers physiological/biological explanations, the middle level considers psychological explanations and the highest level considers social and cultural explanations.

Biological reductionism A form of reductionism which attempts to explain behaviour at the lowest biological level (in terms of the actions of genes, hormones, etc.).

Environmental reductionism The attempt to explain all behaviour in terms of stimulus–response links that have been learned through experience.



A hierarchy of sciences (most reductionist at the bottom).

The holism–reductionism debate

The holism–reductionism debate is the question of whether **holism** or **reductionism** is the better approach to use in order to understand human behaviour. The holistic approach is about studying the 'whole'. As soon as you start to break down a holistic approach, it isn't really holistic any more. Therefore, unlike the other debates you study, there is no continuum between holism and reductionism.

This debate is more about a preference for either holism or reductionism and the different approaches in psychology take sides. For example **humanistic** psychologists take a holistic approach whereas **behaviourists** are reductionist. Within the reductionist approach there is a continuum – the **levels of explanation**, which are explored below.

Key concepts of the debate

Holism

The holistic approach looks at a system as a whole and sees any attempt to subdivide behaviour or experience into smaller units as inappropriate. This was the view of Gestalt psychologists (see Köhler's research on the facing page) who argued that the *whole is greater than the sum of its parts*. Therefore knowing about how the parts (such as the characteristics a person may have) does not help us understand the essence of that person.

Humanistic psychology focuses on the individual's experience, which is not something that can be reduced to, for example, biological units. Humanistic psychologists use **qualitative methods** to investigate the self whereby themes are analysed rather than breaking the concept into component behaviours.

Reductionism

Reductionism seeks to analyse behaviour by breaking it down into its constituent parts. It is based on the scientific principle of *parsimony* – that all phenomena should be explained using the simplest (lowest level) principles.

Levels of explanation in psychology There are different ways to explain behaviour – some more reductionist than others. For instance, **obsessive-compulsive disorder** (OCD) may be understood at a:

- *Socio-cultural level*, e.g. OCD interrupts social relationships.
- *Psychological level*, e.g. the person's experience of anxiety.
- *Physical level* – movements, e.g. washing one's hands.
- *Environmental/behavioural level* – learning experiences.
- *Physiological level*, e.g. abnormal functioning in the frontal lobes.
- *Neurochemical level*, e.g. underproduction of **serotonin**.

Which of these provides the 'best' explanation of OCD is a matter of debate, but each level is more reductionist than the one before.

Psychology itself can be placed in a hierarchy of science (below left). Researchers who favour reductionism would see psychology as ultimately being replaced by explanations derived from those sciences lower down in the hierarchy.

Biological reductionism

Biological reductionism includes the neurochemical and physiological levels (given above) and also **evolutionary** and **genetic** influences. It is based on the premise that we are biological organisms. Thus, all behaviour is at some level biological.

Biologically reductionist arguments often work backwards. For example, drugs that increase serotonin have been found to be effective in treating OCD. Therefore, working backwards, low serotonin may be a cause of OCD. We have reduced OCD to the level of neurotransmitter activity.

Environmental (stimulus–response) reductionism

The **behaviourist approach** is built on **environmental reductionism**, proposing that all behaviour is learned and acquired through interactions with the environment. Behaviourists explain behaviour in terms of conditioning which is focused on simple stimulus–response links, reducing behaviour to these basic elements.

For example, the learning theory of **attachment** reduces the idea of love (between baby and person who does the feeding) to a learned association between the person doing the feeding (neutral stimulus) and food (unconditioned stimulus) resulting in pleasure (conditioned response).

Apply it

Concepts

The nine dot square

Join all nine dots on the right using four straight lines without taking your pen off the paper (clue: think outside the box).

Question

Explain why taking a 'holistic approach' to this puzzle is the best option.



Evaluation

Practical value

One limitation of the holism approach is that it may lack practical value.

Holistic accounts of human behaviour tend to become hard to use as they become more complex. This can present researchers with a practical dilemma. If we accept, from a humanistic perspective, that there are many different factors that contribute to depression (the person's past, their present relationships, their job and family circumstances) then it becomes difficult to know which is most influential. It is then difficult to know which to prioritise as the basis of therapy, for instance.

This suggests that holistic accounts may lack practical value (whereas reductionist accounts may be better).

Scientific approach

One strength of reductionist approaches (and limitation of the holistic approach) is that they often form the basis of a scientific approach.

In order to conduct well-controlled research we need to **operationalise** the variables to be studied – to break target behaviours down into constituent parts. This makes it possible to conduct **experiments** or record **observations** (**behavioural categories**) in a way that is objective and **reliable**. For example, research on attachment (the **Strange Situation**) operationalised component behaviours such as **separation anxiety**.

This scientific approach gives psychology greater credibility, placing it on equal terms with the natural sciences.

Counterpoint Reductionist approaches have been accused of oversimplifying complex phenomena, leading to reduced **validity**. Explanations that operate at the level of the gene or neurotransmitter do not include an analysis of the social context within which behaviour occurs – and this is where the behaviour may derive its meaning. For instance, the physiological processes involved in pointing one's finger will be the same regardless of the context. However, an analysis of these will not tell us why the finger is pointed – it might be to draw attention to some object or person, as an act of aggression, etc.

This suggests that reductionist explanations can only ever form part of an explanation.

Higher level

One limitation of reductionism is that some behaviours can only be understood at a higher level.

Often, there are aspects of social behaviour that only emerge within a group context and cannot be understood in terms of the individual group members. For instance, the effects of conformity to social roles in the prisoners and guards in the Stanford prison study could not be understood by observing the participants as individuals. It was the interaction between people and the behaviour of the group that was important. There is no conformity 'gene' (that we know of) so social processes like conformity can only be explained at the level at which they occur.

This suggests that, for some behaviours, higher level explanations (or even holistic ones) provide a more valid account.

Evaluation eXtra

Brain and mind

Are thoughts simply the result of what happens in our brain? A reductionist account of consciousness would argue this is the case, that we are *thinking machines*. Indeed, this is the basis of **cognitive neuroscience** – that cognitive processes, including all that we think and feel, are associated with physical processes in the brain.

However, what neuroscientists struggle to explain is the subjective experience of the same neural process. For instance, thinking about the colour blue involves exactly the same region and activity in the brain as thinking about the colour red, yet the thought we experience is different. This is referred to as the 'explanatory gap' in brain science (Levine 1983) and may suggest that thinking is at least one step beyond what is happening in the brain.

Consider: *Ultimately can everything be explained in terms of brain activity?*

Apply it Methods

Insight learning – holism in action



Wolfgang Köhler (1925) set hungry chimpanzees a puzzle. A banana and stick were placed outside of a chimpanzee's cage with the stick positioned within reach but the banana was out of reach. Typically the chimpanzee first tried to grasp the banana and failed. There was then a pause in activity and shortly afterwards the chimpanzee, using a seemingly planned and co-ordinated sequence of actions, grabbed the stick and used it to drag the banana over to the cage.

It was as if, in leaving the scene momentarily, the chimpanzee had had a 'eureka' moment in which the solution to the problem had become clear 'in a flash'. There are examples of this in the human world when the solution to a puzzle, problem or issue suddenly appears to us in a flash of inspiration.

Such insight learning can only occur when all the elements of a problem (arm, stick, banana, distance), and the interrelationship between them, are understood as a meaningful whole.

Questions

1. Explain how the **behavioural category** 'insight learning' was **operationalised** in the investigation above. (*2 marks*)
2. Explain why insight learning cannot be explained by behaviourist stimulus–response connections or reinforcement. (*3 marks*)
3. Evaluate the use of **controlled observations** in psychology with reference to Köhler's study above. (*4 marks*)

Apply it Concepts

Machine reductionism

Early cognitive models of information processing were based on the principle of *machine reductionism*. Information processing approaches compare the operations of the mind to those of a computer and produce simple *input-processing-response* models of the mind.

These include models of memory such as the *multi-store model* and *working memory model*. Such models are in contrast to more recent connectionist models of the mind which take a holistic, network-based approach to information processing.

Questions

1. In what ways are models of memory reductionist?
2. What are the strengths and limitations of taking a reductionist approach when explaining memory?

Check it

1. Explain what is meant by 'biological reductionism' in the context of psychology. *[4 marks]*
2. Using an example, explain what is meant by 'levels of explanation' in psychology. *[3 marks]*
3. Explain the difference between biological reductionism and environmental reductionism. *[4 marks]*
4. Discuss holism **and** reductionism in psychology. In your answer, refer to **at least one** topic area that you have studied in psychology. *[16 marks]*

Idiographic and nomothetic approaches

The specification says...

Idiographic and nomothetic approaches to psychological investigation.

Should psychological research focus its attention on the group or the individual? Should the aim of psychological enquiry be to produce *generalities* against which people can be compared and measured? Or should psychology concern itself with what makes people unique, the *specific* rather than the general?

These are the questions that frame the content of this spread.

Key terms

Idiographic approach Derived from the Greek 'idios' meaning 'private' or 'personal'. An approach to research that focuses more on the individual case as a means of understanding behaviour, rather than aiming to formulate general laws of behaviour (the nomothetic approach).

Nomothetic approach Derived from the Greek 'nomos' meaning 'law'. The nomothetic approach aims to study human behaviour through the development of general principles and universal laws.

Study tip

You might be forgiven for confusing the holistic approach (previous spread) with the idiographic approach as they are both concerned with studying individuals in depth. In the idiographic approach, however, there isn't necessarily a focus on the whole individual.



Will we learn more about penguins by studying one individual intensively or by studying many of them?

Apply it

Concepts Take your pick

Select one chapter that you have studied in your Year 1 or Year 2 course. List at least 20 studies that were described in the chapter.

Questions

1. Identify the studies that you think take a nomothetic approach and explain why.
2. Do the same for the idiographic approach.

The idiographic–nomothetic debate

The idiographic–nomothetic debate is centred on two opposing approaches. The **idiographic approach** suggests that psychology should be the study of individuals because, by obtaining lots of detailed information about that individual (or group), we can understand human behaviour better. The **nomothetic approach** suggests that psychology should be the study of large and varied groups to make generalisations about what is typical in different aspects of human behaviour i.e. establishing norms.

This debate has implications for the types of research method psychologists use – whether we study individuals in depth, or study larger groups and discuss averages.

That said, there is also a sense in which these two approaches overlap and both may have their place within a scientific study of the person.

Key concepts of the debate

The idiographic approach to psychological investigation

The number of participants in idiographic research is small, often a single case (single individual or group or institution). Some research might include information from family, friends or others, but the focus is on detail – what can we learn about this individual case? This does not mean that generalisations are not made – but the initial focus is about understanding the individual.

Qualitative research Most idiographic research is **qualitative**. For instance, research on depression would be based on first-hand accounts from a small number of people (**case study**). Participants would be interviewed in depth and the focus may be on a particular facet of human behaviour, such as how the participants coped with their experience (using a fairly **unstructured interview**). Such data is then analysed and emergent themes are identified. Conclusions may help other people going through similar experiences, or more widely, may help mental health professionals determine best practice.

Examples in psychology The idiographic approach is most associated with the **humanistic** and **psychodynamic approaches**. For example Carl Rogers sought to explain the process of self-development including the role of **unconditional positive regard** (page 20). This was derived from in-depth conversations with clients in therapy. Sigmund Freud's careful observations of individuals were the basis of his explanations of human nature, for example the case of Little Hans (page 160) was used to explain how a phobia might develop.

Nomothetic approach to psychological investigation

The main aim of the nomothetic approach is generalisation in order to create 'laws' i.e. create general principles of behaviour (theories) which then, for example, could be applied in individual situations such as drug therapy.

Quantitative research Nomothetic research most closely fits traditional models of the 'scientific method' in psychology. Hypotheses are formulated, samples of people (or sometimes animals) are assessed in some way (perhaps via a **structured questionnaire** or using psychological tests) and the numerical data produced is analysed for its statistical significance. Nomothetic approaches seek to quantify (count) human behaviour.

Examples in psychology The **behaviourist** and **biological approaches** are nomothetic even though they sometimes use quite small samples. For example B.F. Skinner studied animals to develop the general laws of learning (page 10). His research looked at one aspect of behaviour in a few animals but the main aim was to establish general laws. Similarly biological psychology may use a small sample, such as Roger Sperry's **split-brain research** which involved repeated testing and was, in part, the basis for understanding **hemispheric lateralisation** (page 40).

Objective versus subjective

A key difference between idiographic and nomothetic approaches is how each relates to **subjectivity** and **objectivity**. The idea of objectivity lies at the heart of the nomothetic approach. Laws of behaviour are only possible if methods of assessment are delivered in a **standardised** and objective way. This ensures true **replication** occurs across **samples** of behaviour and removes the contaminating influence of bias.

In contrast, researchers working within the idiographic approach tend *not* to believe that objectivity in psychological research is possible. It is people's individual experience of their unique context that is important, rather than some underlying reality 'out there' that is waiting to be discovered.

Evaluation

Complete account

One strength of the idiographic approach is that it contributes to the nomothetic approach.

The idiographic approach uses in-depth qualitative methods of investigation and this provides a global description of one individual. This may complement the nomothetic approach by shedding further light on general laws or indeed by challenging such laws. For example, a single case may generate hypotheses for further study (see the case of HM, right) – *the pebble that starts an avalanche*. Cases like HM may reveal important insights about normal functioning which may contribute to our overall understanding.

This suggests that even though the focus is on fewer individuals, the idiographic approach may still help form 'scientific' laws of behaviour.

Counterpoint That said, supporters of the idiographic approach should still acknowledge the narrow and restricted nature of their work. Meaningful generalisations cannot be made without further examples, as this means there is no adequate baseline with which to compare behaviour. In addition, methods associated with the idiographic approach, such as case studies, tend to be the least scientific in that conclusions often rely on the subjective interpretation of the researcher and, as such, are open to bias.

This suggests that it is difficult to build effective general theories of human behaviour in the complete absence of nomothetic research.

Scientific credibility

One strength of both approaches is that they fit with the aims of science.

The processes involved in nomothetic research are similar to those used in the natural sciences, for example establishing objectivity through standardisation, control and statistical testing. However, researchers using the idiographic approach also seek to objectify their methods. For example, **triangulation** is used whereby findings from a range of studies using different qualitative methods are compared as a way of increasing their **validity**. Also, modern qualitative researchers are careful to reflect upon their own biases and preconceptions as part of the research process (see **reflexivity** on page 95).

This suggests that both the nomothetic and idiographic approaches raise psychology's status as a science.

Losing the person

One limitation of the nomothetic approach is loss of understanding of the individual.

The fact that the nomothetic approach is preoccupied with general laws, prediction and control means it has been accused of 'losing the whole person' within psychology. For example, knowing that there is a 1% lifetime risk of developing schizophrenia tells us little about what life is like for someone who has been diagnosed with the disorder. Understanding the subjective experience of schizophrenia might well prove useful when it comes to devising appropriate treatment options, for example.

This means, in its search for generalities, the nomothetic approach may sometimes fail to relate to 'experience'.

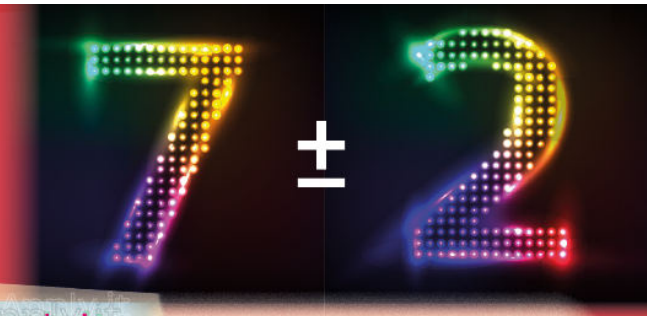
Evaluation eXtra

Distinct or complementary?

It is important to identify the two approaches because they are distinct. Each is appropriate in different situations for different research aims. For instance in attachment research, Schaffer's stages describe general stages of development (nomothetic) whereas case studies of extreme neglect highlight the subjective experience of never having formed an attachment (idiographic).

However, there is also a sense in which the approaches are just two ends of a continuum and it is better to use them in this way. Theodore Millon (1995) explains that when diagnosing personality disorders, for example, clinicians begin with general nomothetic criteria, then use this to focus on the individual and their unique needs.

Consider: *Is the separation of nomothetic and idiographic research a false distinction?*



Apply it
Concepts

Idiographic and nomothetic research on memory

You will recall from your Year 1 studies that George Miller (1956) described the capacity of short-term memory (STM) as 7 ± 2. This is sometimes referred to as Miller's law, that STM has a standard and limited span.

You will also recall from your Year 1 studies that Henry Molaison, otherwise known as HM, was widely studied by psychologists. Following surgery to treat severe epilepsy in 1953, HM developed severe *anterograde amnesia*. He could not commit newly-learned facts or events to long-term memory (LTM) though his STM, and memory for events before the surgery, remained intact. Research with HM demonstrated how he was able to form long-term procedural memories for simple motor skills and tasks (Corkin 2002). The case of HM has proved invaluable in revealing how different types of LTM are more resistant to forgetting and may be stored in different areas of the brain.

Question

Explain how the information above illustrates the value of both idiographic and nomothetic approaches.

Apply it
Methods

IQ testing

IQ tests are an example of the nomothetic approach as they are based on large-scale testing to establish norms for different age groups. IQ scores should form a normal distribution.

Two maths teachers devised an IQ test and gave it to their class of Year 8 students to try. The mean IQ score was 56, the median IQ score was 50 and the modal IQ score was 38.

Questions

1. Identify *three* characteristics of a **normal distribution**. (*3 marks*)
2. Sketch a graph to show the most likely distribution curve for the IQ scores above. Mark on your graph the positions of the mean, median and mode. (*3 marks*)
3. What sort of distribution does your graph show? (*1 mark*)
4. Explain how the maths teachers could assess the **reliability** and **validity** of their IQ test. (*6 marks*)

Check it

1. Explain what is meant by the 'nomothetic approach to psychological investigation'. *[3 marks]*
2. What is an 'idiographic approach'? *[2 marks]*
3. Explain **one** strength of the nomothetic approach to psychological investigation. *[4 marks]*
4. Discuss idiographic **and** nomothetic approaches to psychological investigation. *[16 marks]*

Ethical implications of research studies and theory

The specification says...

Ethical implications of research studies and theory, including reference to social sensitivity.

Psychological research does not occur in a vacuum – it may have a real impact on the lives of those studied as well as the groups that the participants represent. Here, we discuss the wider implications of psychological research and consider whether research that may affect 'vulnerable' groups, on balance, is worthwhile.

Key terms

Ethical implications The consequences of any research (studies and/or theory) in terms of the effects on individual participants or on the way in which certain groups of people are subsequently regarded. There may also be consequences on a wider societal level.

Social sensitivity Sieber and Stanley (1988) define socially sensitive research as, 'studies in which there are potential consequences or implications, either directly for the participants in the research or for the class of individuals represented by the research'.



Apply it Concepts

The mind reader

Adrian Owen has discovered a method to communicate with brain-damaged patients who show very little or no conscious activity – they are in a minimally conscious state or a persistent vegetative state (Cyranoski 2012).

Owen's technique uses fMRI to detect when a patient is saying 'yes' or 'no'. (He tells patients to think of playing tennis if they want to answer 'yes' and then the motor cortex lights up, or to think about walking around their house if they want to answer 'no' and then the memory part of their brain lights up, near the hippocampus).

In the future, this may help clinicians and their patients decide on appropriate treatment plans. It may also help families to communicate with a loved one.

However Owen's work raises ethical questions. Although his first test patient, Kate, went on to make a partial recovery (Wallis 2014), most patients did not respond (about 90% didn't – Monti *et al.* 2010). Patients may be able to answer a sequence of questions, but this does not tell us the extent to which they are conscious nor whether they can make informed decisions.

Questions

1. What are the ethical implications of Owen's work for the person in a minimally conscious state?
2. In what way is Owen's work with brain-damaged patients socially sensitive?

Ethical implications of research studies and theory

In Year 1 you studied **ethical issues** in psychological research, issues such as **deception** and **privacy**. Such issues generally arise because of the conflict between psychology's need to gain valid research findings whilst, at the same time, preserving the rights of participants. **Ethical guidelines** were established to protect participants and guide researchers. We are now going to look at a further reason for guidelines – the **ethical implications** of research.

Ethical implications and social sensitivity

Ethical implications concern the *consequences* that psychological research (studies/theories) may have. Arguably this applies to all psychological research but some areas of research have greater **social sensitivity** than others.

For example, research on long-term memory in a student population is unlikely to have consequences for individual participants, or for the broader social groups the participants represent (in fact the participants may not 'represent' a social group – the participants may be drawn from many different social groups). In addition, there are unlikely to be consequences for social policy.

In contrast, a study on depression may have consequences in terms of individual participants, the wider social group they represent and for social policy. For example, an individual participant may reveal personal information that is later accessed by a prospective employer. Or the findings of the study may suggest that people with depression never fully recover and therefore are a risk as an employee. In terms of social policy, the findings of a study on depression could inform preferred treatment options recommended by the NHS. Indeed, even seemingly innocuous research, such as the memory example above, may have consequences in terms of exam policy.

Implications for the research process

All psychological research has potential consequences but this applies to socially sensitive research in particular. Therefore all stages of planning and conducting studies are important when thinking of social sensitivity, as well as later in handling the findings.

Research question Joan Sieber and Barbara Stanley (1988) warn that the way in which research questions are phrased and investigated may influence the way in which findings are interpreted. For example, Celia Kitzinger and Adrian Coyle (1995) note how research into relationships has been guilty of a form of 'heterosexual bias' within which homosexual relationships were compared and judged against heterosexual norms.

Dealing with participants Issues such as **informed consent**, **confidentiality** and **psychological harm** may be especially important in socially sensitive research. For example, in a study on domestic abuse participants may worry that an ex-partner will find out about the study and also it is likely to be extremely stressful for participants to describe their experiences. Such participants may provide informed consent at the start of the study but not fully understand the effect of the research.

The way findings are used Researchers should consider in advance how research findings may be used. It may impact on what data they actually collect. This is especially important because findings from research may be seen as giving scientific credence to existing prejudices, such as studies examining the ethnic basis of intelligence (see discussion on page 97 of the impact of early IQ testing).

Furthermore sensitive information is exactly what the media tend to be interested in and will publicise. For example, Adrian Owen's research on people in a minimally conscious state received enormous media attention at the time, as it appeared he had made contact with patients who were thought to be 'unreachable' (see left).

Evaluation

Benefits for groups

One strength of socially sensitive research is that it can have benefits for the group who have been studied.

One example of this is homosexuality. In 1952 the **DSM**-1 listed this as a 'sociopathic personality disorder' but finally removed it in 1973. This change has been credited to the Kinsey report which was based on anonymous interviews with over 5000 men about their sexual behaviour (Kinsey *et al.* 1948). The report concluded that homosexuality is a typical expression of human sexual behaviour. The report also included data on interviews with 6000 women and caused outrage at the time because these were topics that no one discussed.

This illustrates the importance of researchers tackling topics that are sensitive.

Counterpoint However, in some studies there could be negative consequences for the groups being studied, which in some cases could have been anticipated. For example, research investigating the genetic basis of criminality has found that there is a 'criminal gene' (see page 329, 'The Mobley defence'). If this is true does it mean that someone could be convicted on the basis that they have such a gene or should they be excused because they cannot be held responsible for any wrongdoing?

This suggests that, when researching socially sensitive topics, there is a need for very careful consideration of the possible outcomes and their consequences.

Real-world application

Another strength is that certain groups (e.g. policymakers) rely on research related to socially sensitive issues.

The government looks to research when developing important social policies, for example decisions related to child care, education, mental health provision, crime and so on. It is clearly preferable to base such policies on scientific research rather than politically-motivated views. For this reason in the UK there are independent groups such as the ONS (Office for National Statistics) who describe themselves as being responsible for collecting, analysing and disseminating objective statistics about the UK's economy, society and population. Such data is used in psychological research.

This means that psychologists have an important role to play in providing high quality research on socially sensitive topics.

Poor research design

One limitation is that poor research design may lead to erroneous findings which, once in the public arena, continue to have an impact.

This was certainly the case in relation to Burt's research (see right) because, even after the fraud was exposed, the 11+ continued to be used. Indeed, the 11+ is *still* used as a selection tool in parts of the UK today (e.g. Kent, Belfast). Similarly, access to many independent schools is based on a child's performance in an entrance exam taken in Year 6 (age 11) and is likely based on the same reasoning – that genetic potential has revealed itself by this age.

Therefore any research on socially sensitive topics needs to be planned with the greatest care to ensure the findings are valid because of the enduring effects on particular groups of people.

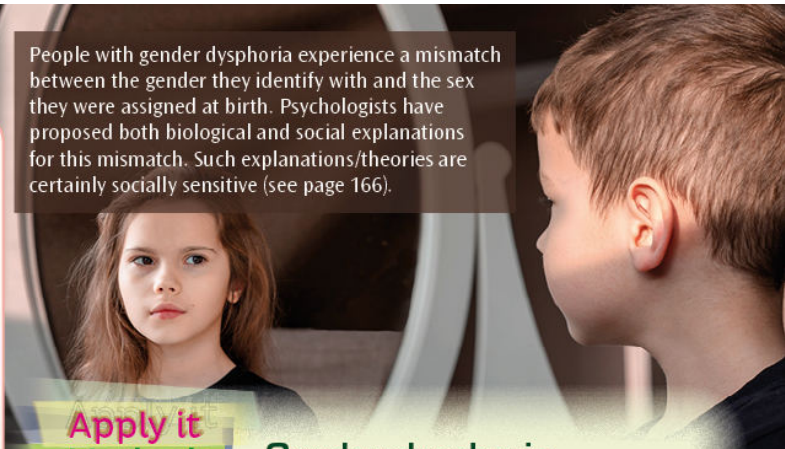
Evaluation eXtra

To do or not to do

One way to deal with socially sensitive research is to avoid doing it. This appears to be what people are doing. The American Psychological Association (APA 2001) reported that ethical committees approved 95% of non-sensitive proposals that didn't include ethical problems whereas 'sensitive' proposals were only approved about 50% of the time.

However, Sieber and Stanley advised that ignoring such topics is not a responsible approach. One possibility is to follow qualitative researchers who are more up-front about their own biases and are **reflexive** in their approach (reflect on how personal beliefs affect the research process).

Consider: *Is it possible to research socially sensitive topics ethically?*



People with gender dysphoria experience a mismatch between the gender they identify with and the sex they were assigned at birth. Psychologists have proposed both biological and social explanations for this mismatch. Such explanations/theories are certainly socially sensitive (see page 166).

Apply it Methods — Gender dysphoria

A psychologist has decided to study a group of teenagers who have been diagnosed with gender dysphoria (see page 166). The researcher will conduct observations and interviews with the teenagers for a year before publishing her findings.

Questions

1. Explain why the proposed research might be considered to be 'socially sensitive'. (*4 marks*)
2. What ethical implications might the research have and how might the psychologist deal with these? (*6 marks*)
3. Evaluate the use of the observational method in psychology. Refer to the study described above in your answer. (*5 marks*)



Research on underage smoking is sensitive because researchers require informed consent from the parents of children under the age of 16 but this would compromise the participants whose parents may not know their children are smokers (Sieber 2004).

Apply it Concepts — The rise and fall of Cyril Burt (public policy)

Cyril Burt (1955) was influential in establishing the 11+ exam which determines what type of secondary school a child goes to (grammar school or other), a decision which arguably has a significant impact on their later life opportunities. The government at the time based its policies on Burt's twin studies which showed that intelligence was highly heritable and could be detected by age 11.

Discrepancies in Burt's 'data' later revealed that much of it was fake, including two 'imaginary' research assistants, and he was publicly discredited (Joynson 1989). The 11+ however, and the idea that children should be separated on the basis of their 'natural' intelligence, remained for many years and still lingers.

Questions

1. What were the ethical implications of Cyril Burt's work?
2. How does the case of Cyril Burt illustrate the importance of the **peer review** process in psychology?

Check it

1. Explain what is meant by 'social sensitivity' in research studies **and** theory. *[4 marks]*
2. Explain how **one** example of research could be considered to be socially sensitive. *[4 marks]*
3. Discuss ethical implications of research studies **and** theory, including reference to social sensitivity. *[16 marks]*

Practical corner

The specification says...

> Knowledge and understanding of ... research methods, practical research skills and maths skills. These should be developed through ... ethical practical research activities.

This means it is important to conduct practical investigations wherever possible. First up, a questionnaire to investigate whether there is a gender difference in students' views on free will and determinism.

Secondly, are students' choices of A level subjects more influenced by their friends or their family? This might lead to some tentative conclusions about whether academic interests are more influenced by nature or nurture.

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?



Leaving aside the debate about whether cats have free will, do men and women think they have?

Practical idea 1: Gender and free will

The aim of this study is to investigate whether there is a gender difference in students' experience of **free will**. Research (e.g. Sherman and McConnell 1995) suggests that women are more likely to have an external locus of control than men, and this may equate to a belief in fatalism (**determinism**) rather than free will.

Will survey data reveal a difference in the judgements between men and women when presented with a number of everyday situations?

The practical bit

The **hypothesis** is that women have a lower control score than men in everyday situations.

To assess this you will need to construct a **questionnaire** that examines how much choice/control people think they have in various situations. In each case, a numerical scale should be included so that respondents are able to indicate their opinion on each of the items they are presented with. Some examples to help you are included below:

Indicate to what extent you think the following outcomes are under your own control (free will) or influenced by factors beyond your control. 1 = totally free will; 10 = totally determined by factors you cannot control.

		Rating you give
a	The grades you will get in your A levels.	
b	The career you will pursue.	
c	Whether or not you will settle down with a long-term partner.	
d	Whether or not you will lose your temper this week.	
e	Whether or not you will be happy.	

Of course you may not want to use these examples, or you may want to include some of them alongside others of your own. You might want to focus on situations, events and behaviours that occur regularly (as in statement d above) or situations that are more long term (as in the other four questions above). What you choose to focus on is entirely up to you but you must ensure that your questions/items are clear and unambiguous, are not **leading questions** and are relevant in terms of the debate.

Choosing your sample

You will need to consider a suitable **sampling technique** for this investigation. It is not essential that an equal number of men and women complete the questionnaire if you intend to work out an average score for each gender. However, the age of participants might be something you want to control as views on this issue may vary with age (you could use a **matched pairs design** or just limit the age group). In terms of the number of respondents, the more the merrier, and this will improve the representative nature of your sample.

Ethical issues

As long as you conduct the investigation appropriately there should be very few **ethical** issues here. It is important to stress the **anonymity** of participants' responses, not least because this may affect the number of **socially desirable** answers they are inclined to give.

Analysing your results

Totalling up the scores for each respondent will allow you to work out the difference in **median** scores between men and women across the whole questionnaire. However, it might also be interesting to analyse the difference within individual items to see in which situations men and women agree – or disagree – most.

Apply it
Methods

The maths bit 1

1. Why is the **median** the most suitable measure of central tendency when summarising the difference in men's and women's views on free will and determinism? (*2 marks*)
2. Investigating whether there is a gender difference in views of free will and determinism is a **quasi-experiment**. Explain why this investigation is a quasi-experiment. (*2 marks*)
3. Which **statistical test** would be most appropriate to calculate the difference in men's and women's views on free will and determinism? Explain *two* reasons for your answer. (*3 marks*)
4. Explain *one* conclusion that can be drawn from the data in Table 1. (*2 marks*)
5. Explain *two* ways in which the **validity** of the free will and determinism questionnaire could be assessed. (*4 marks*)

Table 1 Data from the free will and determinism questionnaire for men and women.

	Men	Women
Median	34	32.5
Range	18	16

Practical idea 2: Nature or nurture

The aim of this study is to see whether students' choices of A level subjects are more influenced by their family or their friends.

Is a student's programme of A level subjects more reflective of their family's choices (potentially suggesting an inherited predisposition) or the choice of their friends (suggesting an environmental influence)?

The theory bit

Where do our interests and talents come from? Are they genetically determined or a product of our environment? Most researchers in psychology would take an **interactionist** stance on this debate (see page 100), claiming that **nature** and **nurture** influences are so intertwined that they cannot be logically separated. Nevertheless, it might be interesting to see whether students' choices of A level subjects have more in common with their family or their friends. Similarity in A level choices between students and their family members might imply a nature influence, whilst similarity between students and their friends might suggest nurture is the key deciding influence.

Selecting a sample

Some careful thought is required here. Finding students with friends is the easy part! Finding students who have members of their immediate family who have taken A levels at some point might be slightly more difficult. Thus, the first question to ask potential participants is whether they have older siblings or parents who have sat A level exams in the past (just one family member will do). Having recorded the relevant data, you should then move on to the participant's closest friend (and again, you only need to ask one friend to make the process of analysis more straightforward).

Your sample is probably an **opportunity sample**. Once you have found a suitable participant who has both a family member and a friend who has studied A levels, and assuming they are happy to take part, you can proceed with the investigation.

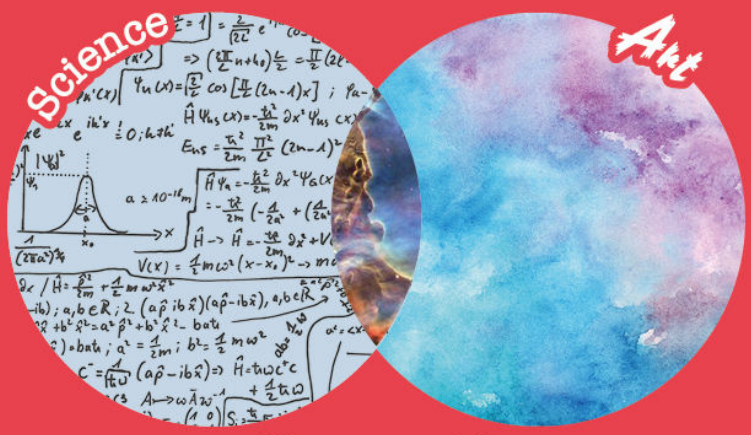
Operationalising subject choice

For ease of recording and analysis, the variable 'A level subject choice' needs to be **operationalised** in as simple a way as possible. How you might want to do this is up to you but the easiest way is to categorise each student in terms of whether they are following an 'arts' or 'sciences' programme. To do this, you will need to draw up a list of A level subjects and divide them using these two categories. Some subjects might be difficult to classify, for instance psychology used to be classed as an 'arts' subject by some universities, now it's usually thought of as a 'science'. If you are in any doubt you might want to ask other people for their opinion (and perhaps include some teachers in this).

Once you have divided up your list of subjects, you can then categorise each student in terms of whether they are predominantly studying 'arts' or 'sciences'. Those students who are taking an equal number of art and science subjects might be best disregarded (or could be a third category)! You should repeat this exercise for one of the student's close friends and one of their family members. The crucial question is whether the student's choice of A levels (as 'arts' or 'sciences') is the same as or different from their friend's and family member's choice.

Problems of interpretation

Whatever the result of this investigation, findings should be treated with caution. Even if it turns out, for instance, that there are more students whose A levels match those of their family member than their friend, this may not necessarily be good evidence for nature over nurture. Can you think why?



Which one are you? And why?

Apply it
Methods

The maths bit 2

1. What is the **level of measurement** in the investigation described? (*1 mark*)
2. What are the **independent** and **dependent variables** in the investigation described? (*2 marks*)
3. With reference to the data in Table 2 below, how many students have been tested? (*1 mark*)
4. What percentage of students had the same choice of A level subjects as their family member? (*1 mark*)
5. What percentage of students had a different choice of A level subjects from their friends? (*1 mark*)
6. Express your answers to question 4 and question 5 as fractions. (*2 marks*)
7. Which statistical test would be most appropriate for analysing the difference in the investigation described? Explain your choice. (*3 marks*)

Table 2 Number of students who had the same or different A level choices as their family member or their close friend.

	Family member	Close friend
Same choice	28	21
Different choice	12	19

The maths bit

Overall, at least 10% of the marks in assessments for Psychology will require the use of mathematical skills and this is included in the requirement that 25–30% in total will involve research methods.

Don't avoid it!



Revision summaries

Gender and culture in Psychology

Gender bias

Predominance of male psychologists has led to biased theories based on a male perspective.

The issue

Universality and bias
Psychologists seek universality but bias may be inevitable (as psychologists are products of their time and place).

Alphas bias
Exaggerates differences, presented as inevitable, tends to devalue females.

Examples – girls have weaker identification with same-sex parent, so weaker conscience (Freud), boys lack connectedness to mother so less empathy (Chodorow).

Beta bias
Underestimates differences e.g. when conducting research.

Examples – fight or flight response based on male animals and assumed to be universal, tend and befriend more common in females (Taylor *et al.*).

Androcentrism
Leads to alpha or beta bias. Normal behaviour is judged from the male standard, e.g. female aggression explained by PMS, male anger seen as rational (Brescoll and Uhlmann).

Evaluation

Biological versus social explanations
Social stereotypes (girls have better verbal ability, boys better spatial ability) presented as facts (Maccoby and Jacklin).

Counterpoint – some stereotypes have a biological basis, e.g. female multitasking explained by better hemispheric connections in women (Ingalhalikar *et al.*).

Sexism in research
Male researchers more likely (Murphy *et al.*) and their expectations about women (e.g. expect irrationality) may mean that female participants underperform in studies (Nicolson).

Gender-biased research
Studies of gender bias published less than studies of other biases e.g. ethnicity, taken less seriously (Formanowicz *et al.*).

Evaluation extra: Good or bad?
Gender-biased research has damaging consequences for women (e.g. validates discriminatory practices), but reflexivity may permit more value-free research.

Cultural bias

Psychology is mainly the study of white American male students.

The issue

Universality and bias (revisited)
68% of research participants from US (Henrich *et al.*), 80% are students (Arnett).

WEIRD participants – Westernised, Educated people from Industrialised, Rich Democracies (Henrich *et al.*)

Ethnocentrism
Superiority of own cultural group, others seen as deficient.

Example – Ainsworth's attachment types, baby left on own classed as insecure led to Japanese babies classed as insecure (Takahashi).

Cultural relativism
Etic (study behaviour from outside a culture) and emic (from inside) (Berry).

Imposed etic = Ainsworth's Strange Situation, definitions of abnormality.

Evaluation

Classic studies
Social influence research, e.g. Asch findings in individualist US, not replicated in collectivist culture (Smith and Bond).

Counterpoint – individualism–collectivism distinction may no longer apply due to increasing global media, no differences in more recent research (Takano and Osaka).

Cultural psychology
Studies how people shape/are shaped by their culture (Cohen), emic approach to avoid ethnocentrism, e.g. local researchers and culturally-based techniques.

Ethnic stereotyping
Early Army IQ tests were ethnocentric, but then used as evidence that certain ethnic/cultural groups were genetically inferior (Gould).

Evaluation extra: Relativism versus universality
Relativism challenges our ethnocentric views and highlights social influences, but there are universals (e.g. emotion and interactional synchrony).

Free will and determinism

Are we in control of our thoughts and behaviour?

The debate

Is our behaviour selected without constraint (free will) or caused by internal or external factors (determinism)?

Key concepts

Free will
Humans are free to make choices. Biological and environmental influences can be rejected, the humanistic approach.

Determinism
Hard determinism (*fatalism*) – all human action has a cause.

Soft determinism – people have freedom to make choices within a restricted range of options.

James thought scientists should explain the determining forces acting upon us, but we still have freedom to make choices.

Types of determinism
Biological determinism e.g. influence of ANS on stress response, genes on mental health. Mediating influence of the environment is also determinist.

Environmental determinism Skinner described free will as 'an illusion'. 'Choice' is the sum total of our reinforcement contingencies.

Psychic determinism Freud identified drives, instincts and unconscious conflicts, repressed in childhood.

The scientific emphasis on causal explanations
Science seeks to explain causes by identifying general laws, the laboratory experiment (like a test tube) allows control over variables.

Evaluation of the debate

Practical value
Adolescents who believed in fatalism more prone to depression, internal locus of control 'healthier' (Roberts *et al.*).

Research evidence
Participants asked to randomly flick wrist and say so, brain activity came before (Libet *et al.*).

Counterpoint – not evidence against free will, delayed conscious awareness still means the person may have made the decision to act.

The law
Hard determinism not consistent with legal principle of moral responsibility.

Evaluation extra: Do we want determinism?
Determinism helps psychology be scientific and leads to useful applications, but free will has intuitive appeal (e.g. not feeling your genes determine you).



The nature-nurture debate

Genes and environment interact to produce behaviour.

The debate

Interactionist approach
Cannot separate nature and nurture, relative contribution is what matters e.g. attachment – parenting (Bowlby) versus temperament of child (Kagan).

Diathesis-stress model
Vulnerability + trigger e.g. OCD (inherited gene + trauma).

Epigenetics
Lifestyle and events (e.g. smoking, trauma) switch genes on or off, permanent and can be passed on.

Key concepts

Nature
Nativists argue that human characteristics are determined by heredity, genes determine behaviour in same way as they determine physical characteristics.

Nurture
Environmental influences written on a blank slate (Locke) e.g. behaviourist approach, both pre- and postnatal levels (Lerner).

Measuring nature and nurture
Concordance estimates how much trait is inherited.

Heritability represents proportion within a population due to genes, IQ = .5 (Plomin).

Evaluation of the debate

Adoption studies
Compare similarities between adopted child and (1) biological and (2) adoptive parents, genes account for 41% of variance (Rhee and Waldman).

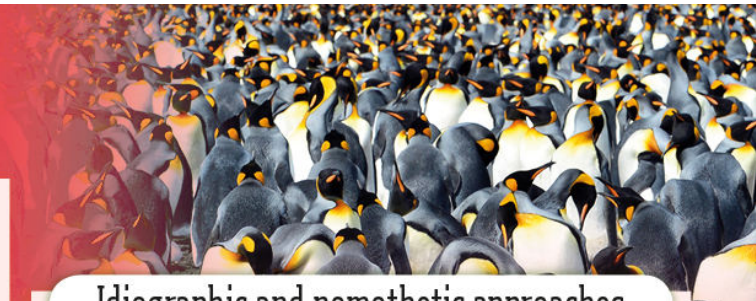
Counterpoint – children create own environment appropriate to their nature (niche-picking, Plomin), aggressive child picks aggressive friends.

Epigenetics
Dutch Hunger Winter, pregnant mothers had low birth weight babies who were twice as likely to later develop schizophrenia (Susser and Lin).

Real-world application
Genetic counselling for e.g. OCD, understand the likelihood and how to prevent (e.g. manage stress).

Evaluation extra: Implications of the debate
Extreme nativism leads to eugenic policies, extreme empiricism leads to behaviour shaping (e.g. aversion therapy).





Holism and reductionism

The whole is greater than the sum of its parts – or not.

The debate

Look at whole person or constituent parts (no continuum).

Reductionism can be broken down into levels of explanation.

Key concepts

Holism

The whole is greater than the sum of its parts, e.g. humanistic and qualitative approaches.

Reductionism

Law of parsimony, reducing to simplest (lowest level) principles.

Levels of explanation – can explain OCD at different levels: socio-cultural, psychological, physical, environmental/behavioural, physiological, neurochemical.

Psychology is one of the least reductionist sciences.

Biological reductionism

Neurochemical, physiological, evolutionary and genetic influences.

For example, OCD reduced to serotonin activity (treatment and explanation).

Environmental (stimulus-response) reductionism

All behaviour acquired through interactions with the environment, e.g. the behaviourist approach (stimulus-response links).

For example, learning theory of attachment, e.g. mother (neutral stimulus), food (unconditioned stimulus) resulting in pleasure (conditioned response).

Evaluation of the debate

Practical value

Holistic accounts become complex and impractical, e.g. difficult to treat depression when causes include past/present experiences and relationships, etc.

Scientific approach

Reductionism is the basis of operationalisation, enables objective and reliable experiments/observations e.g. Strange Situation.

Counterpoint – reductionist approaches in terms of genes/neurotransmitters don't include context and therefore lack meaning, e.g. when pointing your finger.

Higher level

Some behaviours e.g. in the Stanford prison study, can't be understood in terms of individual members, it is about whole group interaction.

Evaluation extra: Brain and mind

We are thinking machines (physical processes in the brain), but does not explain subjective experience (the 'explanatory gap').

Idiographic and nomothetic approaches

In-depth study of unique individuals or formulate general laws.

The debate

Idiographic (detail in single cases) or nomothetic (establish laws or norms).

Key concepts

Idiographic approach to psychological investigation

One person/group/institution.

Qualitative research – thematic analysis of interviews, may make generalisations.

Examples in psychology – Rogers (unconditional positive regard, based on individual clients), Freud (phobia, Little Hans).

Nomothetic approach to psychological investigation

Quantitative research – hypothesis-testing, statistical analysis, seek to quantify behaviour.

Examples in psychology – Skinner (laws of learning), Sperry (split-brain research).

Objective versus subjective

Nomothetic assumes objective measurement is possible through standardisation, idiographic believes only individual experience matters.

Evaluation of the debate

Complete account

Idiographic complements nomothetic e.g. case study of HM informs understanding of memory.

Counterpoint – idiographic approach on own is restricted, no baseline for comparison, also unscientific and subjective.

Scientific credibility

Objectivity e.g. nomothetic (standardisation, control) and idiographic (triangulation, reflexivity).

Losing the person

Nomothetic approach focuses on statistics (1% risk for schizophrenia), overlooks the experience, useful for devising therapy.

Evaluation extra: Distinct or complementary?

Each appropriate in different situations (e.g. Schaffer stages of attachment vs case studies of neglect), or more as a continuum (Millon).

Ethical implications of research studies and theory

Research has social and ethical consequences.

Research

Ethical implications and social sensitivity

Ethical implications are about consequences.

Social sensitivity – research that has consequences for the participants or the groups they represent (e.g. research on memory versus depression).

Implications for the research processes

Research question – narrows focus e.g. 'alternative relationships' has heterosexual bias (Kitzinger and Coyle).

Dealing with participants – victims of domestic abuse may worry about confidentiality, stress of discussing experience.

The way findings are used – may give scientific credence to prejudice e.g. US IQ tests used to restrict immigration.

Media interest e.g. research on patients in a minimally conscious state who could respond (Owen).

Evaluation

Benefits for groups

Homosexuality listed in DSM but the Kinsey report (5000 men interviewed) showed it was 'normal' (Kinsey *et al.*).

Counterpoint – may be negative consequences e.g. the criminal gene has implications for people claiming no responsibility.

Real-world application

Decisions on child care, crime etc. use socially sensitive research e.g. ONS data used by psychologists.

Poor research design

Burt's research in 1950s on IQ led to 11+ exam but later shown to be fraudulent, but too late to change consequences.

Evaluation extra: To do or not to do

Avoid socially sensitive research (only 50% are approved), but not a responsible approach (could be more reflexive as in qualitative research).



Practice questions, answers and feedback

Question 1 Using examples of psychological research, outline the difference between alpha bias and beta bias. (*4 marks*)	
Morticia's answer *Alpha bias is when a theory exaggerates differences between men and women presenting them as real and enduring. A beta bias is when such differences are ignored or minimised. There are many examples of these approaches in psychology.* *As an example of alpha bias we can consider Freud's theory where he described men and women very differently, suggesting that women developed a weaker Superego because it develops as a result of taking on their same-sex parent's moral perspective. Therefore, he concluded that girls/women are morally inferior to boys.*	Morticia's definitions of the two forms of bias are well written. Her example of alpha bias is also detailed and clear. However, there is no attempt to explain how they are different which limits the value of this well-informed answer.
Luke's answer *A theory that is alpha biased is one that exaggerates the differences between men and women, such as Freud's theory which portrayed women as morally weaker than men. In contrast, beta bias is kind of the opposite – a theory that minimises or ignores differences which can happen in studies that use males only (such as early research into fight or flight) and then assumes that women are the same.*	Luke's definitions clearly distinguish between the two forms of bias and he cites two relevant examples of each to support the answer. He uses similar knowledge to Morticia but has framed his answer as required.
Vladimir's answer *Alpha and beta bias are two different ways of representing the differences between men and women. In one case the differences are exaggerated (alpha bias) and in the other they are minimised (beta bias). Examples of alpha bias include Freud's theory. Examples of beta bias include fight or flight research.*	Vladimir has done a good job explaining how the two forms of bias are different. His definitions of alpha and beta bias are brief, though accurate. The examples he identifies are rather 'list-like' and need a bit more description but not much.

Question 2 Briefly outline what is meant by 'holism' in psychological research. (*2 marks*)	
Morticia's answer *Holism is the opposite of reductionism. Reductionism means to break something down into constituent parts whereas holism is looking at the whole thing.*	There is sufficient detail in Morticia's answer for a short question although a reference to 'human behaviour' rather than 'something' might have been more appropriate in the context of psychological research.
Luke's answer *Studying the whole system.*	Luke's answer is too vague for any credit.
Vladimir's answer *A theory or an argument that believes it only makes sense to study the whole system.*	Vladimir has provided a textbook definition but, for a 2-mark question, he needed to do something more, such as add an example.

Question 3 Explain **one** limitation of adopting a holistic approach in psychology. (*4 marks*)	
Morticia's answer *One limitation is that taking the holistic approach makes scientific research more difficult because you can't do research as easily. In order to conduct experiments you have to identify and operationalise variables and this requires identifying constituent parts of a behaviour. On the other hand, holists would argue that the end result of using reductionism is not equivalent to the actual behaviour you are studying. The whole is not equivalent to the sum of the parts.*	Although the first sentence is not very well expressed, the rest of the response is clear and includes a sophisticated counterargument towards the end.
Luke's answer *A holistic approach prevents people finding solutions to problems such as how to treat depression because you have a whole lot of different influences and can't choose which one to deal with. This means that to find solutions to real-world problems we may need to take a more reductionist approach. That doesn't mean that holistic explanations are without value.*	The final sentence in Luke's answer is a little redundant without further development, however the rest is clear. So the answer, overall, lacks full elaboration.
Vladimir's answer *Science is based on reductionism and therefore a holistic approach prevents this. It is better to look at the constituent parts of things to build up to a picture of how the whole thing works and see how lower levels contribute to the higher levels.*	Vladimir's answer hints at a relevant point though there is no explanation of why science is based on reductionism, or why it is 'better' to focus on constituent parts.

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

Question 4 **Stan Sawdust is being tried for attempted murder. He shot a bank worker during an armed robbery and faces a lengthy prison sentence. Stan claims that there are generations of violent criminals in his family. He also says he had a difficult childhood influenced by criminal role models. Therefore Stan argues that he is not responsible for his actions.**

Discuss free will and determinism. Refer to Stan in your answer. (*16 marks*)

Luke's answer *The debate between free will and determinism concerns the argument that an individual's behaviour is controlled by forces outside of an individual's own control. It is interesting to consider the debate in the context of criminal behaviour.*	**A good start – Luke clearly sets out the parameters of the discussion to follow – and keeps the introduction brief.**
From the viewpoint of biological determinism, we could argue that Stan has inherited particular genes from his family that predispose him to be aggressive or to lose his temper. Genes affect the neurotransmitters and hormones that are produced so it could be that he has high levels of testosterone, which makes him aggressive.	**There is descriptive detail in paragraph 2 which is clearly and cleverly linked to the stem of the question.**
However, research on genetics (such as twin studies) always shows there isn't 100% concordance between parents and their children so Stan's behaviour must be in part due to his environment.	**Relevant discussion which is also made relevant to 'Stan'.**
Environmental determinism is the view that conditioning can explain people's behaviour. In Stan's case, the criminal role models would provide vicarious reinforcement for his behaviour to explain why he became a criminal.	**Again, good description as well as application.**
However, taking this kind of stance makes it difficult to see how we can expect people in any society to be responsible for their behaviour. It means that anyone can say 'I couldn't help myself, it was in my genes and the environment that made me this way'. This simply is not acceptable because people have to take some responsibility for themselves.	**Paragraph 5 contains relevant discussion, especially in the context of the stem and its links to crime.**
Soft determinism offers a solution, which is to say that within the determinist framework of identifiable causes there is room for manoeuvre. People do have choices about how they behave within the constraints of who they are, and in that sense, people have free will. So Stan may have been predisposed to behave in a particular way but he could also make some choices.	**In the final four paragraphs Luke loses sight of the stem which affects the overall quality of the answer but he makes some excellent general points and there has been good application earlier.**
The free will side of the debate argues that people can and do make choices. It says that biological and environmental factors have some influence but we can make choices not just from a limited repertoire. The humanistic approach in psychology emphasises the importance of this sense of responsibility for psychological health.	
So this is a strength of the free will approach and is supported by research such as Roberts et al. who found that people who believe in fatalism were more likely to experience depression.	
One of the big challenges for the free will approach came from research by Libet who showed that brain activity associated with muscle movement was recorded before a person made a conscious decision to make the movement, suggesting that even the most basic decisions are being made by the physical brain rather than the conscious self. **(420 words)**	**This is a competent answer with a good degree of 'discussion', including both detail and the important elaboration.**
Vladimir's answer *The determinist approach says that all behaviour has an identifiable cause, it can be explained in terms of some internal or external factor causing it. The free will approach says that people make choices that are not easily predicted from internal or external factors.*	**Vladimir's answer is mostly descriptive, though the description is generally very good. There is reference to several types of determinism, as well as free will, and each concept is well explained.**
One example of determinism is biological determinism, which is genes, neurotransmitters and hormones, which all can cause behaviours. For example, the hormone adrenaline causes us to prepare for fight or flight. Genes are inherited from parents and can explain lots of behaviours – in Stan it's not likely to be just one criminal gene but many genes, but that is still genetic determinism.	
Environmental determinism is when someone is conditioned to behave in a certain way, for example if you are rewarded for doing something it makes it more likely that you will repeat this behaviour. You don't behave because of any decision but because our behaviour is shaped by rewards including vicarious reinforcement. Psychic determinism is the outcome of biological drives and instincts, which Freud suggested. Freud also talked about the influence of unconscious conflicts, which make people behave in ways that they have no awareness of. In contrast there is the free will approach that is the main idea of humanistic psychologists who also think it is important for healthy psychological living.	**Evaluation/discussion points are less in evidence. However, there are a couple of briefly stated discursive points in the penultimate paragraph which should have been explored in much more depth.**
The strength of the determinist approach is that it is the approach taken by science, which assumes all behaviour has a cause. The strength of the free will approach is that most people have a subjective sense that they can make choices at any time. The view of soft determinism is that those choices are made out of a limited number of determined possibilities. Skinner said that it was just an illusion that we are free. Stan's behaviour might be explained by his family background (biological determinism) and also environmental determinism because the environment he grew up in might have rewarded his behaviour. **(320 words)**	**Application to the stem is another very weak aspect of this answer. There are only passing references to 'criminal gene' and 'Stan' in the second paragraph and at the end.**

Multiple-choice questions

Gender bias

1. 'When normal behaviour is judged from a male standard' is a definition of:
   (a) Androcentrism.
   (b) Estrocentrism.
   (c) Ethnocentrism.
   (d) Egocentrism.

2. Which of the following refers to ignoring or minimising differences between the sexes?
   (a) Alpha bias.
   (b) Beta bias.
   (c) Delta bias.
   (d) Theta bias.

3. Female equivalent of the fight or flight response:
   (a) Catch and attach.
   (b) Yearn and return.
   (c) Tend and befriend.
   (d) Arrive and thrive.

4. According to Freud, females have a weaker:
   (a) Id.
   (b) Ego.
   (c) Libido.
   (d) Superego.

5. Theories that suggest real and enduring differences between men and women may be displaying:
   (a) Alpha bias.
   (b) Beta bias.
   (c) Universality.
   (d) Reflexivity.

6. 'Any underlying characteristic of human beings that is capable of being applied to all, despite differences of experience and upbringing' is a description of:
   (a) Alpha bias.
   (b) Beta bias.
   (c) Universality.
   (d) Reflexivity.

Cultural bias

1. The idea that social norms and values can only be understood within a specific cultural context:
   (a) Cultural optimism.
   (b) Cultural relativism.
   (c) Cultural reflexivity.
   (d) Cultural universalism.

2. Critics have argued that Ainsworth's ideal attachment type is an example of:
   (a) Imposed etic.
   (b) Imposed emic.
   (c) Supposed etic.
   (d) Supposed emic.

3. A belief in the superiority of one's own cultural group is best described as:
   (a) Androcentrism.
   (b) Egocentrism.
   (c) Estrocentrism.
   (d) Ethnocentrism.

4. Takano and Osaka found no evidence of:
   (a) Universality of human behaviour.
   (b) Imposed etic in attachment research.
   (c) Methodological issues in cross-cultural studies.
   (d) The distinction between collectivism and individualism.

5. The psychologist who drew distinction between emic and etic approaches is called:
   (a) Barry.
   (b) Berry.
   (c) Billy.
   (d) Burley.

6. In Arnett's review, what percentage of participants were US undergraduates?
   (a) 60%.
   (b) 70%.
   (c) 80%.
   (d) 90%.

Free will and determinism

1. Which of the following is *not* a form of determinism?
   (a) Biological.
   (b) Humanistic.
   (c) Environmental.
   (d) Psychic.

2. Which form of determinism was proposed by William James and underpins the cognitive approach?
   (a) Hard determinism.
   (b) Soft determinism.
   (c) Internal determinism.
   (d) External determinism.

3. Which perspective is most in opposition to the legal principle of moral responsibility?
   (a) Free will.
   (b) Soft determinism.
   (c) The interactionist approach.
   (d) Hard determinism.

4. Free will is a principle at the heart of which approach?
   (a) Biological.
   (b) Behaviourist.
   (c) Humanistic.
   (d) Psychodynamic.

5. Which form of determinism is most associated with Sigmund Freud?
   (a) Psychic.
   (b) Biological.
   (c) Environmental.
   (d) Soft.

6. An alternative term for determinism is:
   (a) Free will.
   (b) Fatalism.
   (c) Favouritism.
   (d) Fauvism.

The nature–nurture debate

1. The nature–nurture debate is sometimes referred to as:
   (a) Holism vs reductionism.
   (b) Idiographic vs nomothetic.
   (c) Heredity vs environment.
   (d) Top-down vs bottom-up.

2. Which of the following would be most closely associated with a nativist approach in the nature–nurture debate?
   (a) The cognitive approach.
   (b) The behaviourist approach.
   (c) The social learning approach.
   (d) The biological approach.

3. Concordance rates are used to estimate the extent to which a given trait is:
   (a) Heritable.
   (b) Immutable.
   (c) Irritable.
   (d) Identical.

4. The philosopher John Locke was best described as:
   (a) A nativist.
   (b) A geneticist.
   (c) A humanist.
   (d) An empiricist.

5. An example of an interactionist approach to the nature–nurture debate is:
   (a) The diagnosis–strain model.
   (b) The didactic–strike model.
   (c) The diathesis–stress model.
   (d) The diagonal–straight model.

6. If an adopted child had more in common with its adoptive parents, this would suggest:
   (a) Environment is influential.
   (b) Genes are influential.
   (c) Both are influential.
   (d) Neither are influential.



Holism and reductionism

1. **A reductionist approach would have difficulty explaining which of the following?**
   (a) Genetic theories of crime.
   (b) The learning theory of attachment.
   (c) Explanations of conformity.
   (d) Neurochemical basis of OCD.

2. **Stimulus–response learning is a good example of:**
   (a) Environmental reductionism.
   (b) Biological reductionism.
   (c) Psychic reductionism.
   (d) Holism.

3. **Which of the following explanations of OCD would illustrate the neurochemical level?**
   (a) Most people would regard the behaviour as odd or irrational.
   (b) The experience of obsessive thoughts.
   (c) Overactivity of the basal ganglia.
   (d) Underproduction of serotonin.

4. **According to the hierarchy of science, which of these is the most reductionist?**
   (a) Psychology.
   (b) Biology.
   (c) Chemistry.
   (d) Physics.

5. **Reductionism is based on the scientific principle of:**
   (a) Hegemony.
   (b) Philanthropy.
   (c) Theocracy.
   (d) Parsimony.

6. **Which of the following advocates a holistic view of human behaviour?**
   (a) The cognitive approach.
   (b) The behaviourist approach.
   (c) The biological approach.
   (d) The humanistic approach.

Idiographic and nomothetic approaches

1. **Which of the following would be most closely associated with the nomothetic approach?**
   (a) Quantitative data.
   (b) Case studies.
   (c) Unstructured interviews.
   (d) Qualitative data.

2. **Which of the following would *not* be associated with the nomothetic approach?**
   (a) The humanistic approach.
   (b) The biological approach.
   (c) The behaviourist approach.
   (d) The cognitive approach.

3. **Which of the following would be associated with the idiographic approach?**
   (a) Classifying people into groups.
   (b) Establishing principles of behaviour in general.
   (c) Describing unusual individuals in detail.
   (d) Establishing dimensions along which people can be compared.

4. **Which of the following is the best example of the idiographic approach?**
   (a) Miller's law of short-term memory.
   (b) Freud's study of Little Hans.
   (c) Behaviourist laws of learning.
   (d) IQ testing.

5. **The idiographic approach is likely to produce:**
   (a) Quantitative data.
   (b) Qualitative data.
   (c) Numerical data.
   (d) Statistical data.

6. **Idiographic is derived from the Greek 'idios' which means:**
   (a) Private and personal.
   (b) Public and plausible.
   (c) General and global.
   (d) Separate and specific.

Ethical implications of research studies and theory

1. **Research that may have consequences for those studied is referred to as:**
   (a) Pseudoscientific.
   (b) Self-serving.
   (c) Situation specific.
   (d) Socially sensitive.

2. **A stage of research that may have ethical implications:**
   (a) The way findings are used.
   (b) The research question.
   (c) Dealing with participants.
   (d) All of the above.

3. **Kitzinger and Coyle suggested that research questions concerning _____ relationships result in a heterosexual bias:**
   (a) Heterosexual.
   (b) Homosexual.
   (c) Alternative.
   (d) Unisexual.

4. **Categorised as a sociopathic personality disorder until 1973:**
   (a) Heterosexuality.
   (b) Bisexuality.
   (c) Pansexuality.
   (d) Homosexuality.

5. **Researcher accused of using fraudulent data in his research on intelligence:**
   (a) Kinsey.
   (b) Sieber.
   (c) Burt.
   (d) Black.

6. **When researchers are 'up front' about their biases and preconceptions:**
   (a) Reactivity.
   (b) Reflexivity.
   (c) Responsibility.
   (d) Replicability.



MCQ answers
Gender bias 1A, 2B, 3C, 4D, 5A, 6C
Cultural bias 1B, 2A, 3D, 4D, 5B, 6C
Free will and determinism 1B, 2B, 3D, 4C, 5A, 6B
The nature–nurture debate 1C, 2D, 3A, 4D, 5C, 6A
Holism and reductionism 1C, 2A, 3D, 4D, 5D, 6D
Idiographic and nomothetic approaches 1A, 2A, 3C, 4B, 5B, 6A
Ethical implications of research studies and theory 1D, 2D, 3C, 4D, 5C, 6B

Chapter 5 Relationships



What are the ingredients of a relationship that can keep a couple together for half a century or more?

'The meeting of two personalities is like the contact of two chemical substances: if there is any reaction, both are transformed.'

Carl Gustav Jung, psychologist (1933)



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Most psychological research has focused on romantic relationships. There is research on family relationships (you studied attachment in your Year 1 studies) and also research on peer friendships.

However, the theories/research topics named in the specification mainly concern romantic relationships – and, in the past, research has had a strong heterosexual bias, though that is now changing.

Evolutionary explanations for partner preferences

The specification says...

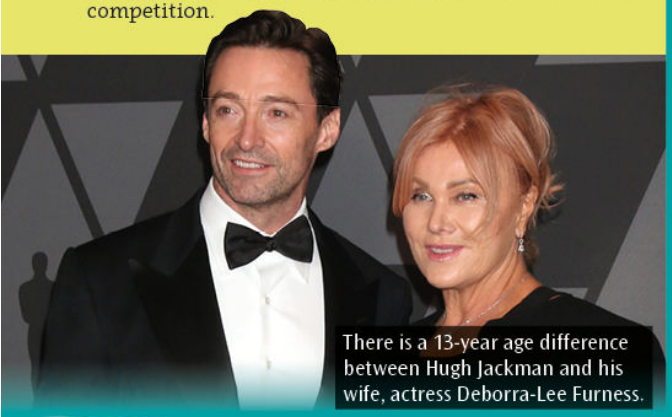
> The evolutionary explanations for partner preferences, including the relationship between sexual selection and human reproductive behaviour.

On page 16 we explained Charles Darwin's theory of evolution by natural selection. Darwin recognised that this theory could not explain certain animal characteristics. For example, a male peacock's gaudy and cumbersome tail would appear to threaten the bird's survival. To explain why such traits persist Darwin proposed an additional theory – the theory of sexual selection.

Key terms

Sexual selection An evolutionary explanation of partner preference. Attributes or behaviours that increase reproductive success are passed on and may become exaggerated over succeeding generations of offspring.

Human reproductive behaviour This refers to any behaviours which relate to opportunities to reproduce and thereby increase the survival chances of our genes. It includes the evolutionary mechanisms underlying our partner preferences, such as mate choice and mate competition.



There is a 13-year age difference between Hugh Jackman and his wife, actress Deborra-Lee Furness.

Apply it Concepts – Three relationships

Kaley is an attractive 25-year-old woman who has recently married Ryan, a 60-year-old man who owns five successful businesses. They have no children yet, but are hoping to start a family soon.

Nicole and Keith have been together for just over five years. There is an age gap between them – Keith is 29 and Nicole is 53, but this doesn't seem to make any difference to their relationship or their feelings for each other. Nicole has three children from a previous marriage.

Benedict and Eddie have been in a civil partnership for nearly eight years. Both men are in their thirties and are looking to adopt a child in the near future.

Questions

1. Use evolutionary explanations of human reproductive behaviour to explain these relationships.
2. Are there any behaviours that can't be explained by evolutionary arguments? Explain your answer.

Sexual selection

Darwin's (1871) concept of **sexual selection** concerns the selection of those characteristics that aid successful reproduction (rather than survival). Some physical characteristics, such as a male peacock's tail, are a sign of **genetic** fitness. Females who select males with such characteristics are more likely to produce robust offspring and therefore the preference for such a tail is perpetuated in future generations. Other characteristics, such as aggressiveness, are **adaptive** because they provide an advantage for a male over competitors for reproductive rights. The aggressive characteristics that allowed the animal to reproduce in the first place are passed on to offspring *if* they are genetically determined and the genes that gave rise to the characteristics remain in the population.

Anisogamy

The basis of **human reproductive behaviour** is **anisogamy**, which refers to the differences between male and female sex cells (gametes). Male gametes (sperm) are small, highly mobile, created continuously in vast numbers from puberty to old age and do not need much energy to be produced.

In contrast, female gametes (eggs or ova) are relatively large, static, produced at intervals for a limited number of fertile years and require a significant investment of energy.

One consequence of anisogamy is that there is no shortage of fertile males but a fertile female is a much rarer 'resource'. Anisogamy is important in partner preference because it gives rise to two types of sexual selection.

Inter-sexual selection

Inter-sexual selection is *between* (inter) the sexes – the strategies that males use to select females or females use to select males. Inter-sexual selection is the preferred strategy of the female, quality over quantity (ova are rarer than sperm).

Robert Trivers (1972) pointed out that the female makes a greater investment of time, commitment and other resources before, during and after the birth of her offspring. Both sexes are choosy, because both stand to lose if they invest resources in substandard partners. But the consequences of making a wrong partner choice are more serious for the female, so it pays for her to be especially selective. Therefore, the female's optimum mating strategy is to select a genetically fit partner who is able to provide resources.

It is this female preference which determines which features are passed on to the offspring. For example, if height is considered an attractive male trait by females then it would increase in the male population over successive generations. This is because, in each generation, females will select the tallest males and thus that characteristic gradually becomes exaggerated (a *runaway process*).

Ronald Fisher (1930) developed a *sexy sons hypothesis* – the genes we see today are those that enhanced reproductive success. A female who mates with a male who has a certain characteristic then will have sons who inherit this 'sexy' trait. Then her sons are also more likely to be selected by successive generations of females who will mate with her offspring. Therefore the preference for this 'sexy' trait is perpetuated.

Intra-sexual selection

Intra-sexual selection is *within* (intra) each sex – such as the strategies between males to be the one that is selected. It is the preferred strategy of the male, quantity over quality (there is a plentiful supply of sperm).

There is competition between males to be selected to mate with a female. The winner of the competition reproduces and therefore the characteristics that contributed to his victory may be passed on to his offspring (and losers do not pass on their 'losing' characteristics because they don't mate).

This strategy has given rise to *dimorphism* (means 'two forms') – males and females end up looking very different because of intra-sexual selection. For example, in any physical competition between males, size matters. Larger males have an advantage and are therefore more likely to be reproductively successful. On the other hand, females do not compete for reproductive rights so there is no evolutionary drive towards favouring larger females. However, in females youthfulness is selected because males have a preference to mate with younger more fertile women (as indicated in humans by, for example, a large waist-to-hip ratio).

Intra-sexual selection also has behavioural consequences, although these are controversial. The characteristics that are favoured and passed on are those that allow a male to outcompete his rivals, including deceitfulness, intelligence and aggression. For example, males may benefit from behaving aggressively in order to acquire fertile females and protect them from competing males (mate retention strategies, see page 298). This leads to the selection of aggressiveness in males.

Evaluation

Research support for inter-sexual selection

One strength is evidence supporting the specific role of female choosiness in heterosexual partner preference.

Russell Clark and Elaine Hatfield (1989) sent male and female psychology students out across a university campus. They approached other students individually with this question: 'I have been noticing you around campus. I find you to be very attractive. Would you go to bed with me tonight?'. Not a single female student agreed to the request, whereas 75% of males did, immediately.

This supports the view that females are choosier than males when it comes to selecting sexual partners and that males have evolved a different strategy to ensure reproductive success.

Counterpoint The argument from sexual selection that one strategy is adaptive for all males and another is adaptive for all females is simplistic. At the very least it appears that strategies differ according to the length of the relationship. Sexual strategies theory (Buss and Schmitt 2016) argues that both males and females adopt similar mating strategies when seeking long-term relationships. Both sexes are very choosy and look for partners who are loving, loyal and kind, for example.

This is a more complex and nuanced view of how evolutionary pressures influence partner preferences which takes account of the context of reproductive behaviour.

Research support for intra-sexual selection

Another strength is evidence to support the predictions of sexual selection theory.

David Buss (1989) carried out a survey of over 10,000 adults in 33 countries. He asked questions relating to a variety of attributes that **evolutionary** theory predicts are important in partner preference. He found that females placed greater value on resource-related characteristics than males did, such as good financial prospects and ambition. Males valued physical attractiveness and youth (as signs of good reproductive capacity) more than females did.

These findings reflect consistent sex differences in partner preferences and support the predictions from sexual selection theory.

Social and cultural influences underestimated

One limitation is that evolutionary theories overlook the influences of social and cultural factors on partner preference.

Partner preferences over the past century have undoubtedly been influenced by rapidly changing social norms of behaviour. These develop much faster than evolutionary timescales imply and have instead come about due to cultural factors (e.g. availability of contraception). Women's greater role in the workplace means they are no longer dependent on men to provide for them (despite the ongoing inequality in earning power). Tamas Bereczkei *et al.* (1997) argue that this social change has consequences for women's mate preferences, which may no longer be resource-oriented.

Therefore, partner preferences today are likely to be the outcome of a combination of evolutionary and cultural influences. Any theory that fails to account for both is a limited explanation.

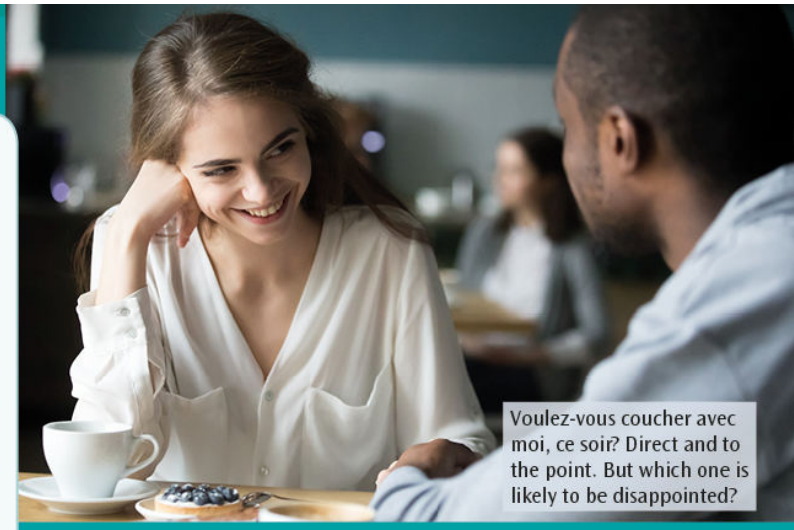
Evaluation eXtra

Sexual selection and homosexuality

A criticism often made of sexual selection theory is that it cannot explain the partner preferences of gay men and lesbian women. This is mainly because in homosexual relationships partners are not assessing genetic fitness (though they may assess other qualities relevant to caring for offspring).

Jamie Lawson *et al.* (2014) looked at 'personal ads' placed by heterosexual and homosexual men and women (describing what they are looking for in a partner and what they offering). They found that the preferences of homosexual men and women differ just as they do in heterosexual men and women (men emphasised physical attractiveness and women emphasised resources).

Consider: *What does this tell us about evolutionary explanations for partner preferences?*



Voulez-vous coucher avec moi, ce soir? Direct and to the point. But which one is likely to be disappointed?

Apply it Concepts — Young, free, single

Shakira and Gerard are young and single people who seem to have a new partner almost every night. They make no bones about the fact that they are out to have a good time while they're still young.

Questions

1. How do you think society generally would view Shakira's and Gerard's behaviour?
2. Is there an evolutionary explanation for why one of their behaviours might be considered acceptable and the other not? Explain your answer.

Apply it Methods — Replicating Buss

An evolutionary psychologist wanted to replicate the study by Buss (above left) by using an interview method. He carried out face-to-face interviews with 45 men and 37 women. He asked various questions about their preferences for certain evolutionarily-important characteristics in a partner. Physical attractiveness was deemed important by 40 of the men and 28 of the women. Good financial prospects was an attribute deemed important by 25 of the men and 32 of the women.

Questions

1. The study produced a lot of **quantitative data**. Explain what is meant by this term. (*2 marks*)
2. Write a question that could gather quantitative data. (*2 marks*)
3. Explain *two* differences between a **structured** and an **unstructured interview**. (*2 marks + 2 marks*)
4. Explain *one* reason why the psychologist thought interviews might be better than **questionnaires** in this study. (*2 marks*)
5. Calculate the preferences of men and women as percentages (*four* percentages). (*4 marks*)

Check it

1. Explain what is meant by 'sexual selection'. *[2 marks]*
2. Briefly outline **one** evolutionary explanation of partner preference. *[4 marks]*
3. Describe **and** evaluate evolutionary explanations of partner preference. *[16 marks]*
4. Discuss the relationship between sexual selection **and** human reproductive behaviour. *[16 marks]*

Factors affecting attraction: Self-disclosure

The specification says...

Factors affecting attraction in romantic relationships: self-disclosure.

'The course of true love never did run smooth', Shakespeare tells us in *A Midsummer Night's Dream*. But how can it run smoother? How can it get started at all in the first place?

Psychologists have identified several factors that influence whether or not (and how much) we are attracted to a potential romantic partner. We will be looking at three in total, beginning with *self-disclosure*.

Key term

Self-disclosure Revealing personal information about yourself. Romantic partners reveal more about their true selves as their relationship develops. These self-disclosures about one's deepest thoughts and feelings can strengthen a romantic bond when used appropriately.

Apply it
Concepts

Hollywood couples still together

The actors Felicity Huffman and William H. Macy have been happily married since 1997. When asked the secret of their longevity, Huffman said, 'Once a week we sit down and make sure we get half an hour – each of us gets 15 minutes – just to talk, with no crosstalk. I talk, then you talk. You kind of just deeply check in with the other person.'

Questions

1. Explain how research into self-disclosure confirms Huffman and Macy's experience of a satisfying relationship.
2. Why do you think it needs to be a two-way process?



'But soft! What light through yonder window breaks?
It is the east, and Juliet is the sun.
... It is my lady, O, it is my love!
O that she knew she were!'

The most basic self-disclosure in any romantic relationship – telling someone you love them.

Self-disclosure

In the early days of a relationship, we love to learn as much as we can about our new partner, and the more we learn about them the more we seem to like them. By revealing ourselves to another person, we share our likes and dislikes, our hopes and fears, our interests and attitudes. We share what really matters to us. Our partner understands us better, and we them.

This **self-disclosure** has a vital role in a relationship beyond the initial attraction. But most people are careful about what they disclose, at least to begin with. Used wisely and effectively it really can help the course of true love run smoother.

Social penetration theory

Self-disclosure is a major concept within Irwin Altman and Dalmas Taylor's (1973) *social penetration theory* of how relationships develop. It is the gradual process of revealing your inner self to someone else, of giving away your deepest thoughts and feelings. In romantic relationships, it involves the reciprocal exchange of information between intimate partners. When one partner reveals some personal information they are signalling 'I trust you'. To go further the other partner must also reveal sensitive information. As they increasingly disclose more and more, romantic partners 'penetrate' more deeply into each other's lives, and gain a greater understanding of each other.

It is a basic feature of romantic relationships. After all, it's difficult to 'bear one's soul' to a relative stranger. Doing so means that a relationship has reached a certain stage where such self-disclosure will be welcomed and – hopefully – reciprocated.

Breadth and depth of self-disclosure

According to Altman and Taylor, self-disclosure has two elements – breadth and depth. As both of these increase, romantic partners become more committed to each other. The researchers use the metaphor of the many layers of an onion to illustrate this process. We disclose a lot about ourselves at the start of a relationship, but what we reveal is superficial, mostly 'on the surface', like the outer layers of an onion. It is the kind of 'low-risk' information we would reveal to anyone, friends, co-workers, even acquaintances. Breadth of disclosure is narrow because many topics are 'off-limits' in the early stage of a relationship. If we were to reveal too much too soon, we might get the response 'TMI!' (too much information), possibly even threatening the relationship before it's had a chance to get going.

However, as a relationship develops, self-disclosure becomes deeper, progressively removing more and more layers to reveal our true selves and encompassing a wider range of topics, especially concerning those things that matter most to us. Eventually we are prepared to reveal intimate, high-risk information – painful memories and experiences, strongly-held beliefs, perhaps even secrets.

Altman and Taylor also used the term *depenetration* to describe how dissatisfied partners self-disclose less as they gradually disengage from the relationship.

Reciprocity of self-disclosure

As Harry Reis and Philip Shaver (1988) point out, for a relationship to develop, as well as an increase in breadth and depth there needs to be a *reciprocal* element to disclosure. Once you have decided to disclose something that reveals your true self, hopefully your partner will respond in a way that is rewarding, with empathy and also their own intimate thoughts and feelings. So there is a balance of self-disclosure between both partners in a successful romantic relationship, which increases feelings of intimacy and deepens the relationship.

Evaluation

Research support

One strength is that several predictions about self-disclosure derived from social penetration theory have been supported by research.

Susan Sprecher and Susan Hendrick (2004) studied heterosexual dating couples and found strong **correlations** between several measures of satisfaction and self-disclosure for both partners. Men and women who used self-disclosure (and believed their partners did likewise) were more satisfied with and committed to their romantic relationship. In a later study, Sprecher *et al.* (2013) showed that relationships are closer and more satisfying when partners take turns to self-disclose (i.e. disclosure is reciprocated).

These supportive research findings increase the **validity** of the theory that reciprocated self-disclosure leads to more satisfying relationships.

Counterpoint Much self-disclosure research is correlational, including Sprecher and Hendrick's study. It is usually assumed that greater self-disclosure creates more satisfaction (i.e. a causal link) but a correlation does not tell us if this is a valid conclusion to draw. Alternative explanations are just as likely. For instance, it may be that the more satisfied the partners are, the more they self-disclose. Or perhaps self-disclosure and satisfaction are independent of each other and both are caused by a third variable. This could be the amount of time the partners spend together.

Therefore self-disclosures may not cause satisfaction directly, reducing the validity of social penetration theory of self-disclosure.

Real-world application

Another strength is that research into self-disclosure can help people who want to improve communication in their relationships.

Romantic partners sometimes use self-disclosure deliberately to increase intimacy and strengthen their bond. Stephen Haas and Laura Stafford (1998) found that 57% of homosexual men and women said that open and honest self-disclosure was the main way they maintained and deepened their relationships. If less-skilled partners (e.g. those who limit communication to 'small talk') learn to use self-disclosure then this could bring several benefits to their relationships in terms of deepening satisfaction and commitment.

This shows that psychological insights can be valuable in helping people who are having problems in their relationships.

Cultural differences

One limitation is that it is not true for all cultures that increasing depth and breadth of self-disclosures leads to a more satisfying and intimate romantic relationship.

Nu Tang *et al.* (2013) reviewed research into sexual self-disclosure (i.e. disclosures related to feelings about specific sexual practices). They concluded that men and women in the US (generally an **individualist culture**) self-disclose significantly more sexual thoughts and feelings than men and women in China (generally a **collectivist culture**). Despite lower levels of disclosure in China, levels of satisfaction were no different from those in the US.

Therefore self-disclosure theory is a limited explanation of romantic relationships because it is based on findings from individualist cultures which are not necessarily **generalisable** to other cultures.

Evaluation eXtra

Self-disclosure and breakdown

According to social penetration theory, romantic relationships become more satisfying as self-disclosure increases. Conversely, partners find non-disclosure dissatisfying and it is associated with relationship breakdown.

But theories of relationship breakdown (such as Steve Duck's, see page 132) point out that partners often self-disclose more often and more deeply as their relationship deteriorates. This does not increase satisfaction and is often not enough to save the relationship.

Consider: *What does relationship breakdown tell us about social penetration theory's view of self-disclosure?*



Thinks: *'I like babies too, but we've only been going out with each other for three days'.*

Self-disclosure is a skill. If you reveal too much too early in a relationship, it might not go down too well.

Apply it Concepts — Public disclosures

People disclose a lot more in front of strangers in a television studio than we would usually consider publicly acceptable. For example, episodes on one TV programme have included, 'Were you having an affair when you told me you were on holiday?' and 'Was my fiancée lying about being pregnant to avoid a lie detector test?'.

Questions

1. Explain some of the pitfalls of excessive and poorly timed self-disclosure.
2. Give some examples of 'too much information!' at the start of a promising romantic relationship.

Apply it Methods — Tell me what you feel

Two psychologists recruited 100 long-term couples for a study of relationship satisfaction. They asked the participants to keep a daily diary of their self-disclosures to their partner over a one-month period. The researchers used content analysis to analyse the data from the diaries.

They found that 15% of the self-disclosures related to sex, 10% to experiences in previous relationships, 25% to family matters, 30% to hopes and fears about the future, and 15% to health concerns. 5% of self-disclosures could not be categorised.

Questions

1. Explain how the psychologists could have carried out their **content analysis**. (*4 marks*)
2. The study gathered a lot of **qualitative data**. Explain what is meant by 'qualitative data'. (*2 marks*)
3. Outline *one* strength of gathering qualitative data in this study. (*2 marks*)
4. Outline *one* **sampling** method the psychologists could have used to recruit the participants. (*2 marks*)
5. Explain *one* limitation of this method. (*2 marks*)

Check it

1. In relation to factors affecting attraction in romantic relationships, explain what is meant by 'self-disclosure'. *[2 marks]*
2. Briefly outline self-disclosure as a factor affecting attraction in romantic relationships. *[4 marks]*
3. Describe what research has found concerning the role of self-disclosure as a factor affecting attraction in romantic relationships. *[6 marks]*
4. Discuss self-disclosure as a factor affecting attraction in romantic relationships. *[16 marks]*

Factors affecting attraction: Physical attractiveness

The specification says...

Factors affecting attraction in romantic relationships: physical attractiveness, including the matching hypothesis.

Physical attractiveness is probably the one feature of an individual we notice as soon as we meet them, even before we've spoken or interacted with them in any meaningful way. It is the basis of online dating agencies – the first encounter you have with a potential date is a photograph of their face. On this spread, we look at just how important it really is.

Key terms

Physical attractiveness An important factor in the formation of romantic relationships. The term usually applies specifically to how appealing we find a person's face. There is general agreement within and across cultures about what is considered physically attractive, and an assumption that we seek to form relationships with the most attractive person available.

Matching hypothesis The belief that we do not select the most attractive person as a prospective partner but, instead, are attracted to a person who approximately 'matches' us in physical (i.e. facial) attractiveness. This implies that we take into account our own attractiveness 'value' to others when seeking a romantic partner.



Well-matched in the looks department? The matching hypothesis suggests that 'matching' is what matters.

Study tip

All the explanations in this section focus on the initial stage of a relationship – attraction. Make sure you always focus on this when discussing, for example, physical attractiveness. This is not a theory of relationships, it is an explanation of attraction.

Physical attractiveness

Explaining the importance of physical attractiveness

Psychologists have wondered why **physical attractiveness** seems to be quite so important in forming relationships. One promising explanation draws upon evolutionary theory related to **sexual selection** (see page 118). Todd Shackelford and Randy Larsen (1997) found that people with symmetrical faces are rated as more attractive. This is because it may be an honest signal of genetic fitness (it's difficult to fake facial symmetry).

People are also attracted to faces with *neotenous* (baby-face) features such as widely separated and large eyes, a delicate chin and a small nose – because these trigger a protective or caring instinct.

The halo effect

Physical attractiveness may also matter because we have preconceived ideas about the personality traits attractive people must have, and they are almost universally positive. This is the *physical attractiveness stereotype,* a widely-accepted view of attractive people neatly summed up in a phrase coined by Karen Dion and her colleagues (1972): 'What is beautiful is good'. For example, Dion *et al.* found that physically attractive people are consistently rated as kind, strong, sociable and successful compared to unattractive people. The belief that good-looking people probably have these characteristics makes them even more attractive to us, so we behave positively towards them – a good example of a *self-fulfilling prophecy.*

Psychologists use the term *halo effect* to describe how one distinguishing feature (physical attractiveness, in this case) tends to have a disproportionate influence on our judgements of a person's other attributes, for example, their personality.

Research on the matching hypothesis

The **matching hypothesis** (Walster and Walster 1969) suggests that we look for partners who are similar to ourselves in terms of physical attractiveness (and also similar in terms of personality, intelligence etc) instead of choosing the most appealing people. Elaine Walster *et al.* (1966) designed a study to test this called 'The computer dance'.

Procedure Male and female students were invited to a dance. They were rated for physical attractiveness by objective observers at the start and also completed a questionnaire about themselves. They were told the data about themselves (personality, self-esteem etc) and that this information would be used by a computer to decide their partner for the evening (in fact they were paired up randomly).

Findings The hypothesis was not supported. The most liked partners were also the most physically attractive rather than taking their own level of attractiveness into account.

However, Ellen Berscheid *et al.* (1971) **replicated** the study but this time each participant was able to select their partner from people of varying degrees of attractiveness. This time participants tended to choose partners who matched them in physical attractiveness.

Conclusions We tend to seek and choose partners whose attractiveness matches our own. For example, if we judge ourselves as a '6 out of 10' then we are likely to seek a mate of a similar level of attractiveness. Therefore choice of partner is a compromise – we risk rejection in selecting the most attractive people available so we settle on those who are 'in our league' physically.

Apply it Concepts

Is my halo slipping?

Rob is generally agreed to be a very good looking chap. In fact, he would by most assessments be described as stunningly handsome. Women – and men – find him physically very attractive and he has received a lot of 'offers' down the years. He has also found that people smile at him everywhere he goes, are very polite and friendly towards him and assume he must be very intelligent as well as handsome (which he is of course, but that's not the point).

Questions

1. Using your knowledge of the halo effect explain Rob's experiences.
2. Can you think of any drawbacks to his good looks?

Practical activity on page 138

Evaluation

Research support for the halo effect

One strength is evidence that physical attractiveness is associated with a halo effect.

Carl Palmer and Rolfe Peterson (2012) found that physically attractive people were rated as more politically knowledgeable and competent than unattractive people. This halo effect was so powerful that it persisted even when participants knew that these 'knowledgeable' people had no particular expertise.

This finding has implications for the political process – it suggests there are dangers for democracy if politicians are judged as suitable for office just because they are considered physically attractive by enough voters.

Evolutionary explanation

Another strength is that the role of physical attractiveness is research support for evolutionary processes.

Michael Cunningham *et al.* (1995) found that women who had features of large eyes, prominent cheekbones, small nose and high eyebrows were rated as highly attractive by white, Hispanic and Asian men. The researchers concluded that what is considered physically attractive is remarkably consistent across different societies. Attractive features (symmetry) are a sign of genetic fitness and therefore perpetuated similarly in all cultures (sexual selection).

Therefore the importance of physical attractiveness makes sense at an evolutionary level.

Research challenging the matching hypothesis

One limitation is the matching hypothesis is not supported by real-world research into dating.

Lindsay Taylor *et al.* (2011) studied the activity logs of a popular online dating site. This was a real-world test of the matching hypothesis because it measured actual date choices and not merely preferences. This is in keeping with the original hypothesis which concerned realistic as opposed to fantasy choices. The researchers found that online daters sought meetings with potential partners who were more physically attractive than them.

This undermines the **validity** of the matching hypothesis because it contradicts the central prediction about matching attractiveness.

Counterpoint However, choosing individuals for dating could be considered a different situation from selecting a partner for a romantic relationship. In fact, Alan Feingold (1988) carried out a **meta-analysis** of 17 studies and found a **significant correlation** in ratings of physical attractiveness between romantic partners. Also, just because online daters seek more attractive potential partners does not mean that they get them! So dating selection may be just as 'fantasy' as it is in **laboratory** research.

Therefore there is support for the matching hypothesis from studies of real-world established romantic partners.

Evaluation eXtra

Individual differences

Most of the evidence on this spread highlights the important role of physical attractiveness in the initial formation of romantic relationships (such as sexual selection).

But there is also evidence that some people do not attach much importance to attractiveness. John Touhey (1979) measured sexist attitudes of men and women (using the MACHO scale) and found that low scorers were relatively unaffected by physical attractiveness when judging the likeability of potential partners.

Consider: *What does this tell us about the role of physical attractiveness in the formation of romantic relationships?*

Apply it Concepts

Celebrity mismatch?

Charlize is very interested in celebrities, and over the years she has noticed that many celebrity couples seem to be very well-matched in attractiveness. There's Kanye West and Kim Kardashian, as well as Elton John and David Furnish. But Charlize's friend Sean disagrees: 'What about Catherine Zeta-Jones and Michael Douglas? She's so much more attractive than him.'

Question

Explain how research into the matching hypothesis can help us to decide whether Charlize or Sean is right.



Online dating may forever have changed relationship formation, for gay and lesbian as well as straight people. But it arguably makes physical attractiveness even more important.

Apply it Methods

Match me up!

A psychologist was interested in testing the matching hypothesis. She recruited 44 women by using an opportunity sampling method. Each participant was individually introduced to two men. The three of them had a 10-minute discussion about what they found attractive in a partner. One of the men had been rated by independent judges as attractive and the other unattractive. Each woman was rated in the same way. Each participant then had to choose which of the men she would prefer to go on a date with. The results are shown in Table 1.

Table 1 Number of attractive and unattractive women choosing a date with the attractive or unattractive man.

	Attractive man	Unattractive man
Attractive woman	17	14
Unattractive woman	8	5

Questions

1. Identify and explain the type of **experimental design** used in this study. (*1 mark + 2 marks*)
2. Suggest *one* **extraneous variable** in this study and explain how it might have affected the results. (*3 marks*)
3. Name a suitable **statistical test** to analyse the data in Table 1. (*1 mark*)
4. Explain *two* reasons why you have chosen this test. (*2 marks + 2 marks*)
5. A friend of the researcher disagreed with this result. She has been in many relationships and, in her experience, people always want the best-looking partners. Explain why the friend's personal opinion is no substitute for scientific evidence. (*4 marks*)

Check it

1. In relation to factors affecting attraction in romantic relationships, explain what is meant by the 'matching hypothesis'. *[2 marks]*
2. Outline physical attractiveness as a factor affecting attraction in romantic relationships. *[4 marks]*
3. Outline the matching hypothesis as an explanation of factors affecting attraction in romantic relationships. *[4 marks]*
4. Discuss physical attractiveness as a factor affecting attraction in romantic relationships. *[16 marks]*

Factors affecting attraction: Filter theory

The specification says...

Factors affecting attraction in romantic relationships: filter theory, including social demography, similarity in attitudes and complementarity.

'So many men, so little time.' Not Shakespeare on this occasion, but old-time Hollywood star Mae West, who knew a thing or two about relationships. Fortunately (or unfortunately) for most of us, the number of men or women available as potential partners is not as huge as it apparently was for Mae West. That's because several factors drastically reduce the size of the 'pond we fish in'. So your partners are likely to come from a surprisingly limited group. At least, that's the claim made by filter theory, our final look at what influences that initial attraction.

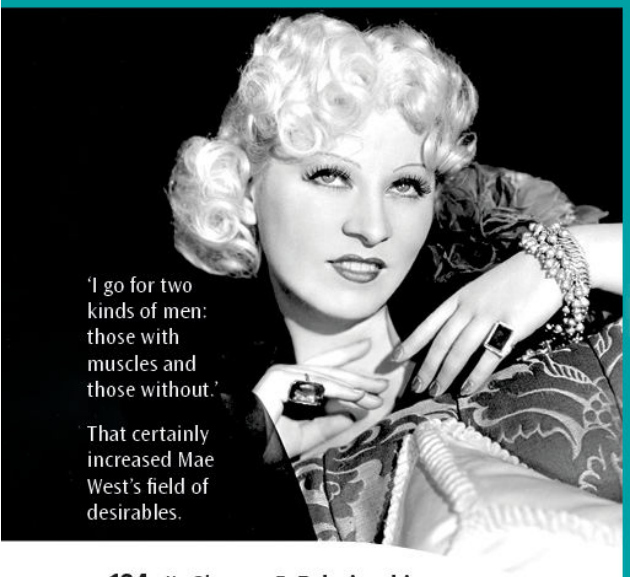
Key terms

Filter theory An explanation of relationship formation. It states that a series of different factors progressively reduces the range of available romantic partners to a much smaller pool of possibilities. The filters include social demography, similarity in attitudes and complementarity.

Social demography Demographics are features that describe populations, social demographics include geographical location and social class. Such factors filter out a large number of available partners. This means many relationships are formed between partners who share social demographic characteristics.

Similarity in attitudes We find partners who share our basic values attractive in the earlier stages of a relationship, so we tend to discount available individuals who differ markedly from us in their attitudes.

Complementarity Similarity becomes less important as a relationship develops, and is replaced by a need for your partner to balance your traits with opposite ones of their own.



'I go for two kinds of men: those with muscles and those without.'

That certainly increased Mae West's field of desirables.

Filter theory

Alan Kerckhoff and Keith Davis (1962) compared the attitudes and personalities of student couples in short-term (defined as less than 18 months) and long-term relationships. They devised a **filter theory** to explain how such romantic relationships form and develop.

In terms of partner choice, we all have a *field of availables*, the entire set of potential romantic partners, all the people we could realistically form a relationship with. But, of course, not everyone who is available to us is desirable. According to Kerckhoff and Davis, there are three main factors that act as filters to narrow down our range of partner choice to a *field of desirables*. Each of these factors assumes greater or lesser importance at different stages of a relationship.

Social demography (1st level of filter)

Social demography refers to a wide range of factors all of which influence the chances of potential partners meeting each other in the first place. They include geographical location (or *proximity*), social class, level of education, ethnic group, religion and so on. You are much more likely to meet people who are physically close to you and who share several demographic characteristics. Although we might frequently encounter people who live further away, our most meaningful and memorable interactions are with people who are nearby. The key benefit of proximity is *accessibility*. It doesn't require much effort to meet people who live in the same area, go to the same school or university, and so on.

Although there is a vast range and variety of potential partners, the realistic field is much narrower because our choices are constrained by our social circumstances. Effectively, anyone who is too 'different' (too far away, too middle class) is discounted as a potential partner. The outcome of this filtering is *homogamy*, meaning you are more likely to form a relationship with someone who is socially or culturally similar. You will probably have a fair bit in common with someone who shares, for example, your ethnicity, religious beliefs and educational level and most of us find such shared demographic similarities attractive.

Similarity in attitudes (2nd level of filter)

Partners will often share important beliefs and values, partly because the *field of availables* has already been narrowed by the first filter to those who have significant social and cultural characteristics in common. Kerckhoff and Davis found that **similarity of attitudes** was important to the development of romantic relationships, but only for the couples who had been together less than 18 months. There is a need for partners in the earlier stages of a relationship to agree over basic values, the things that really matter to them. This encourages greater and deeper communication, and promotes **self-disclosure** (see page 120).

There is considerable evidence that most of us find this similarity attractive, at least to begin with. Donn Byrne (1997) has described the consistent findings that similarity causes attraction as the *law of attraction*. If such similarity does not exist (for example, it turns out the partners have little in common after all), then the relationship is likely to fizzle out with a 'I'll call you sometime'.

Complementarity (3rd level of filter)

The third filter concerns the ability of romantic partners to meet each other's needs. Two partners complement each other when they have traits that the other lacks. For example, one partner may enjoy making the other laugh, and in turn this partner enjoys being made to laugh. Or perhaps one partner is more dominant in the relationship than the other. Or one likes to nurture and the other to be nurtured. Kerckhoff and Davis found that the need for **complementarity** was more important for the long-term couples. In other words, at a later stage of a relationship, opposites attract. Complementarity is attractive because it gives two romantic partners the feeling that together they form a whole, which adds depth to a relationship and makes it more likely to flourish.

Apply it

Concepts

Still loving after all these years

Pat and Phil first met when they were both 13 years old, on Pat's paper round. Two years after that they started going out with each other and were madly in love, until they broke up three years later. They lost touch, but 44 years later these childhood sweethearts rediscovered each other and finally got married.

Question

Explain how relationships like the one between Pat and Phil are formed in terms of (a) social demographics, (b) similarity of attitudes, and (c) complementarity.

Evaluation

Research support

One strength is support from Kerckhoff and Davis's original study.

The researchers conducted a **longitudinal study** in which both partners in dating couples completed questionnaires to assess two main factors – similarity of attitudes/values and complementarity of needs. Relationship 'closeness' was measured by another questionnaire seven months later. The study found that closeness was associated with similarity of values but only for couples who had been together less than 18 months. For couples in longer relationships, complementarity of needs predicted closeness.

This study provided evidence that similarity is important in the early stages of a relationship, but complementarity is more important later on.

Counterpoint George Levinger (1974) pointed out that many studies have failed to **replicate** the original findings of Kerckhoff and Davis. He put this down to social changes over time (e.g. dating patterns) and also to problems in defining the depth of a relationship in terms of its length. Kerckhoff and Davis chose an 18-month cut-off point to distinguish between short-term and long-term relationships. They assumed that partners who had been together longer than this were more committed and had a deeper relationship.

This is a questionable assumption which means that filter theory is undermined by the lack of **validity** of its evidence base.

Problems with complementarity

One limitation is that complementarity may not be central to all longer-term relationships.

A prediction of filter theory is that in the most satisfying relationships partners are complementary, for example one partner may have a need to be dominant and the other a need to be submissive. However, Patrick Markey and Charlotte Markey (2013) found that lesbian couples of equal dominance were the most satisfied. Their sample of couples had been romantically involved for a mean time of more than 4½ years.

This suggests that similarity of needs rather than complementarity may be associated with long-term satisfaction, at least in some couples.

Actual versus perceived similarity

Another limitation is that actual similarity matters less in a relationship than whether partners perceive or believe themselves to be similar.

This was supported in a **meta-analysis** of 313 studies by Matthew Montoya *et al.* (2008). They found that actual similarity affected attraction only in very short-term lab-based interactions. In real-world relationships, perceived similarity was a stronger predictor of attraction. One interpretation of this finding is that partners may perceive greater similarities as they become more attracted to each other.

Therefore perceived similarity may be an effect of attraction and not a cause, which is not predicted by the filter model.

Evaluation eXtra

Social change

Filter theory claims that demographic factors (including location) reduce the field of availables to a relatively small pool of people similar to ourselves (homogamy).

However, the role of filters has changed over time. In terms of the 1st level filter, online dating and apps have increased the field of availables so that location no longer limits partner choice (physical appearance is more important). Social changes have led to relationships that were less common 30 years ago, e.g. between partners from differing ethnic backgrounds.

Consider: *Could filter theory be adapted to explain more modern behaviour? If so, how?*

A variety of men. Different ages, ethnicities, education levels, but filter theory claims we're attracted to those who are similar to us – 'birds of a feather flock together', at least to begin with.



Apply it Concepts — Growing together

Yuki and Keiko have been together for 12 years. They had lots in common when they first met. But even after all that time, they still agree with each other over most matters, have similar interests and do a lot of things together.

Question

Do Yuki and Keiko's experiences of their relationship support or challenge filter theory? Explain your answer.

Apply it Methods — You and me, the same?

A psychologist investigated the similarity of attitudes between romantic partners in the early stages of a relationship. He recruited a volunteer sample of ten couples who had been together for less than six months. Each partner completed a questionnaire to measure their attitudes to a variety of issues, each one yielding a score between 1 and 20.

Questions

1. Write a **directional hypothesis** for this study. (*2 marks*)
2. Explain how the psychologist could have checked the **reliability** of the attitude **questionnaire**. (*3 marks*)
3. Explain why a **volunteer sample** was used in this study. (*2 marks*)

The results of the study are given in Table 1 below.

Table 1 Attitude scores for 10 romantic couples.

Couple	Partner 1	Partner 2
1	17	14
2	8	5
3	11	14
4	14	18
5	4	2

Couple	Partner 1	Partner 2
6	8	10
7	15	12
8	10	13
9	7	4
10	12	9

4. Identify an appropriate **statistical test** the researcher could use to analyse the data. (*1 mark*)
5. Give *two* reasons why this would be an appropriate test to use. (*2 marks*)

Check it

1. In relation to the filter theory of romantic relationships, explain what is meant by 'social demography' **and** 'complementarity' *[2 marks + 2 marks]*
2. Outline the filter theory of romantic relationships. *[4 marks]*
3. Briefly explain **two** criticisms of the filter theory of romantic relationships. *[2 marks + 2 marks]*
4. Discuss filter theory as a factor affecting attraction in romantic relationships. *[16 marks]*

Theories of romantic relationships: Social exchange theory

The specification says...

Theories of romantic relationships: social exchange theory.

Social exchange theory (SET) is one of a number of *economic theories* of relationships, so-called because they are based on the assumption that people in romantic relationships (like all others) both seek an 'exchange of goods'.

Such theories assume that we act out of self-interest though there is mutual interdependence.

Key term

Social exchange theory A theory of how relationships form and develop. It assumes that romantic partners act out of self-interest in exchanging rewards and costs. A satisfying and committed relationship is maintained when rewards exceed costs and potential alternatives are less attractive than the current relationship.

Apply it
Concepts

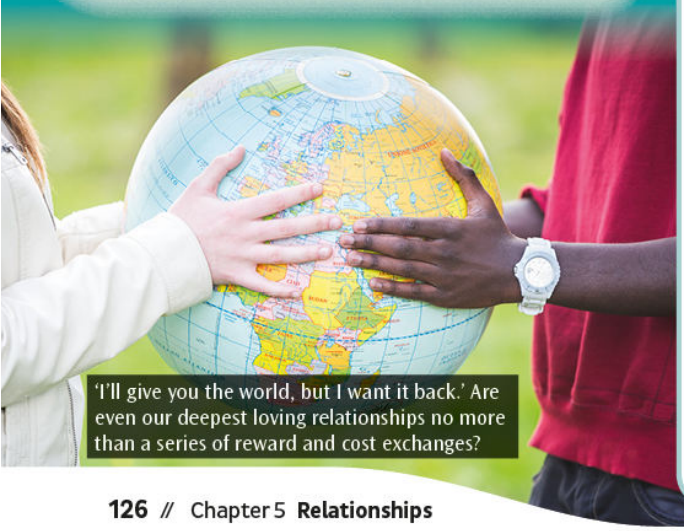
Love is ... never counting the cost?

Anushka and Ranveer are a couple who have been married for over 30 years. Anushka is terminally ill, but Ranveer decided he would care for her at home rather than see her put into a nursing home. He has been looking after Anushka virtually round the clock for several months, and she now has just days to live.

Kareena works in an office with 11 other people. Each year without fail, everyone gives each other a Christmas card. Kareena can remember how embarrassed she was the year she first joined the company, when she accidently left one of her co-workers off her list.

Question

Explain how each of these scenarios can be interpreted using social exchange theory.



'I'll give you the world, but I want it back.' Are even our deepest loving relationships no more than a series of reward and cost exchanges?

Social exchange theory

Rewards, costs and profits

John Thibault and Harold Kelley (1959) proposed **social exchange theory** (SET), claiming that behaviour in relationships reflects the economic assumptions of exchange. Most importantly, they say we try to minimise losses and maximise gains (the *minimax principle*). We judge our satisfaction with a relationship in terms of the profit it yields, defined as the rewards minus the costs.

Because such rewards and costs are subjective, there exists a very wide range of possible outcomes. What one person considers a significant reward might be viewed by someone else as less valuable. For example, you might consider receiving praise from your partner as a prized reward, but your partner can take it or leave it. Also, the value of rewards and costs might well change over the course of a relationship. What is seen as rewarding or costly in the early stages, for instance, might become less so as time goes on.

Rewards include such beneficial things as companionship, sex and emotional support. But a romantic relationship is not always 'a bed of roses'. It can involve negative and unpleasant emotions as well as pleasurable ones. In the economic language of Peter Blau (1964) relationships can be 'expensive', so costs include time, stress, energy, compromise, and so on. Also in economic terms, a relationship incurs another kind of cost, an *opportunity cost*. Your investment of time and energy in your current relationship means using resources that you cannot invest elsewhere.

Comparison level

There are two ways in which we measure the profit in a romantic relationship. The first, the *comparison level* (CL), is essentially the amount of reward that you believe you deserve to get. It develops out of our experiences of previous relationships which feed into our expectations of the current one. It is also influenced by **social norms** that determine what is widely considered, within a culture, to be a reasonable level of reward. This is often reflected in books, films and TV programmes such as soap operas. Over time, we get more relationships 'under our belt' and more experience of social norms, so our CL changes as we acquire more 'data' to set it by.

We consider a relationship worth pursuing if our CL is high. There is an obvious link with **self-esteem** here. Someone with low self-esteem will have a low CL and will therefore be satisfied with gaining just a small profit (or even a loss) from a relationship. Someone with higher self-esteem will believe they are worth a lot more.

Comparison level for alternatives

The second measure of profit, the *comparison level for alternatives* (CLalt), provides a wider context for our current relationship. Do we believe we could gain greater rewards and fewer costs from another relationship (or from being on our own)? Given that romantic relationships in our culture are usually exclusive, we ask ourselves, 'Could I do better? Is the grass greener elsewhere?'. SET predicts that we will stay in our current relationship only so long as we believe it is more rewarding than the alternatives.

According to relationships researcher Steve Duck (1994), the CLalt we adopt will depend on the state of our current relationship. There are usually 'plenty more fish in the sea', so if the costs of our current relationship outweigh the rewards, then alternatives become more attractive.

Stages of relationship development

Another feature of Thibault and Kelley's social exchange theory concerns the four stages through which relationships (and the social exchanges which underpin them) develop:

- *Sampling stage* – we explore the rewards and costs of social exchange by experimenting with them in our own relationships (not just romantic ones), or by observing others doing so.
- *Bargaining stage* – this marks the beginning of a relationship, when romantic partners start exchanging various rewards and costs, negotiating and identifying what is most profitable.
- *Commitment stage* – as time goes on, the sources of costs and rewards become more predictable and the relationship becomes more stable as rewards increase and costs lessen.
- *Institutionalisation stage* – the partners are now settled down because the norms of the relationship, in terms of rewards and costs, are firmly established.

Evaluation

Research support

One strength is support for aspects of SET from research studies.

Lawrence Kurdek (1995) asked gay, lesbian and heterosexual couples to complete questionnaires measuring relationship commitment and SET variables. He found that those partners who were most committed also perceived the most rewards and fewest costs and viewed alternatives as relatively unattractive. More importantly this was the first study to demonstrate that the main SET concepts that predict commitment are independent of each other (so they individually have an effect).

These findings match predictions from SET, strongly confirming the **validity** of the theory in gay and lesbian couples as well as in heterosexual partners.

Counterpoint Studies into SET (including Kurdek's) ignore one crucial factor that may be an overwhelming consideration for romantic partners – equity. The next spread explains how this shortcoming of SET has been addressed by another theory (equity theory). There is much research support for the role of equity in relationships. What matters is not just the balance of rewards and costs, but the partners' perceptions that this is fair.

The neglect of equity means that SET is a limited explanation which cannot account for a significant proportion of the research findings on relationships.

Direction of cause and effect

One limitation of SET is its claim that dissatisfaction arises only after a relationship stops being 'profitable'.

According to SET, we become dissatisfied when we conclude that the costs of the relationship outweigh its rewards and/or that the alternatives are more attractive (i.e. these factors cause dissatisfaction). But Michael Argyle (1987) argued that we don't monitor costs and rewards, or consider alternatives, until *after we are dissatisfied*. When we are satisfied with a relationship and committed to it, we do not even notice potentially attractive alternatives.

This suggests that considering costs/alternatives is caused by dissatisfaction rather than the reverse (dissatisfaction causes a person to consider costs/alternatives).

Vague concepts

Another limitation is that SET deals in concepts that are vague and hard to quantify.

Rewards and costs have been defined superficially in research (e.g. money) in order to measure them. But real-world psychological rewards and costs are subjective and harder to define. For example most people would consider 'having your partner's loyalty' to be rewarding. But rewards and costs vary a lot from one person to another – even 'having loyalty' is not a reward for everyone. The concept of comparison levels is especially problematic. It is unclear what the values of CL and CLalt must be before dissatisfaction threatens a relationship.

This means the theory is difficult to test in a valid way.

Evaluation eXtra

Inappropriate central assumptions

SET assumes that relationships are economic in nature, e.g. exchange of rewards and costs, profit and loss, constant monitoring to determine levels of satisfaction. SET claims these concepts apply to all relationships.

However, Margaret Clark and Judson Mills (2011) argue that we cannot apply this to romantic relationships. Romantic relationships are *communal*-based. Romantic partners do not 'keep score' because, if they did, it would destroy the trust that underlies a close emotional relationship.

Consider: *Are all relationships exchange-based?*

Apply it Concepts — You scratch my back

Eric and Arianna found each other on an online dating site, and have just spent their first day together in the real world. They are both very keen on each other, and both think the other is very attractive. But everywhere they went together, Arianna was totting up how much each of them had spent. It was her idea they split the bill in the restaurant. And every time Eric said something nice to her, she had to do the same to him. But Eric just can't be doing with all that, so now he isn't sure he wants to continue the relationship.

Question

Which of Eric and Arianna is behaving in ways predicted by social exchange theory?



Dodgy first date? Too much exchange monitoring at the start of a relationship and we might wonder if our partner would rather be 'just friends'.

Apply it Methods — Players of games

A psychologist decides to test the social exchange theory of relationships by using a game-playing scenario. He recruits two groups of romantic partners – some who have been together for less than two months and others for more than two years. One partner in each couple is Player A and the other is Player B. Player A gives £10 to Player B. The experimenter triples this amount and gives it all to Player B. Player B then has to decide how much to give back to Player A, from nothing to £30. The psychologist found that in couples who had been together less than two months, the mean amount returned by Player B was £17.50. The corresponding figure for couples who had been together for more than two years was £12.40.

Questions

1. Write a **non-directional hypothesis** for this **experiment**. (*2 marks*)
2. What **experimental design** is used in this study? (*1 mark*)
3. The researcher assigned the roles of Player A and Player B randomly. Explain how he could have done this and why it was necessary. (*2 marks + 2 marks*)
4. Explain why this experiment might be lacking in validity. (*3 marks*)

Check it

1. Explain what is meant by 'social exchange' in relation to romantic relationships. *[2 marks]*
2. Briefly outline the social exchange theory of romantic relationships. *[4 marks]*
3. Explain **one** of the key concepts in social exchange theory. *[3 marks]*
4. Describe **and** evaluate the social exchange theory of romantic relationships. *[16 marks]*

Theories of romantic relationships: Equity theory

The specification says...

Theories of romantic relationships: equity theory.

Do we really think about our closest relationships in terms of the rewards and costs they bring us? Would we leave our current partner if we felt that we could get a better deal elsewhere? We all know lots of couples in which one partner seems to contribute a lot more to the relationship than the other, but both appear to be happy and satisfied.

There's something missing from social exchange theory and that something is equity – the idea that you can put a lot into a relationship and still be happy, as long as there is a perceived sense of fairness.

Key term

Equity theory An economic theory of how relationships develop. As such, it acknowledges the impact of rewards and costs on relationship satisfaction, but criticises social exchange theory for ignoring the central role of equity – the perception that partners have about whether the distribution of rewards and costs in the relationship is fair.

Apply it Concepts

Fair's fair ... or is it?

Since Kasper and Dom moved in together two years ago, their relationship has changed drastically. Kasper used to make much more of an effort, but now he does very little and seems happy for Dom to do all the running. Apart from doing most of the domestic chores and keeping the house going, it seems Dom is also responsible for the emotional well-being of the relationship. Dom is finding it stressful.

Jess and Justin have been married for 15 years. It took a while, but Jess eventually realised that Justin's depression meant that he couldn't put as much into the relationship as he once did. She's now used to having to keep their relationship going, but she loves her husband and is glad she can do something to help him. And there are times when he feels much better anyway.

Questions

1. Explain Dom's and Jess's experiences of their relationships in terms of equity theory.
2. What do you think they might do to change things?

Study tip

Equity is not the same as equality. Romantic partners do not have to get the same amount of rewards and costs in a relationship. But there needs to be a fair balance between the two.

Equity theory

Equity theory is another economic theory which developed in response to a significant criticism of **social exchange theory** (SET). Maximising rewards and minimising costs are important, but SET fails to take into account the need most people have for balance rather than profit in a relationship.

The role of equity

The term 'equity' means fairness. According to Elaine Walster and her colleagues (1978), what matters most with equity is that both partners' level of *profit* (rewards minus costs) is roughly the same. This is not the same as equality where costs and rewards have to be the same (i.e., 'equal') for each partner. When there is a lack of equity, then one partner *overbenefits* and the other *underbenefits* from the relationship, and (according to equity theory) this is a recipe for dissatisfaction and unhappiness.

Both overbenefit and underbenefit are examples of inequity although it is the underbenefitted partner who is likely to feel the greatest dissatisfaction, in the form of anger, hostility, resentment and humiliation. The overbenefitted partner will likely feel guilt, discomfort and shame. Thus satisfaction is about perceived fairness.

Equity and equality

According to equity theory, it's not the size or amount of the rewards and costs that matters, it's the ratio of the two to each other. So if one partner puts a lot into the relationship but at the same time gets a lot out of it, then they are likely to feel satisfied.

For example, imagine a relationship in which one partner works night shifts and therefore cannot cook the children's tea. A precisely equal distribution of domestic tasks would probably not be seen as fair by either partner. The equity in such a relationship may well come from the compensations that the night-shift partner could offer in other areas, or from the satisfactions that the other partner gains. Satisfying relationships are marked by negotiations to ensure equity, that rewards are distributed fairly (not necessarily equally) between the partners. This inevitably involves making trade-offs.

Consequences of inequity

Problems arise when one partner puts a great deal into the relationship but gets little out of it. A partner who perceives inequity will become distressed and dissatisfied with the relationship if this state of affairs continues for long enough. The greater the perceived inequity, the greater the dissatisfaction – equity theory predicts a strong **correlation** between the two. This applies to both the overbenefitted and underbenefitted partner to the extent that they both perceive the inequity.

Changes in perceived equity What makes us most dissatisfied is a change in the level of perceived equity as time goes on. For example, at the start of a relationship it may feel perfectly natural to contribute more than you receive. But if the relationship develops in such a way that you continue to put more into the relationship and get less out of it, this will not feel as satisfying as it did in the early days.

Dealing with inequity How do romantic partners react to inequity? The underbenefitted partner is usually motivated to make the relationship more equitable as long as they believe it is possible to do so and that the relationship is salvageable. The more unfair the relationship feels, the harder they will work to restore equity (another strong correlation).

On the other hand, another possible outcome is a cognitive rather than behavioural one. They will revise their perceptions of rewards and costs so that the relationship feels more equitable to them, even if nothing actually changes. What was once seen as definitely a cost earlier in the relationship (untidiness, thoughtlessness, actual abuse) is now accepted as the norm.

Equity is about balance but not equalness.



Evaluation

Research support

One strength is evidence from studies of real-world relationships that confirm equity theory as a more valid explanation than SET.

For example, Mary Utne *et al*. (1984) carried out a survey of 118 recently-married couples, measuring equity with two self-report scales. The participants were aged between 16 and 45 years and had been together for more than two years before marrying. The researchers found that couples who considered their relationship equitable were more satisfied than those who saw themselves as overbenefitting or underbenefitting.

This study confirms that equity is a major concern of romantic couples and is linked with satisfaction, a central prediction of equity theory.

Counterpoint Equity may be a feature of satisfaction in relationships (as predicted by equity theory) but Daniel Berg and Kristen McQuinn (1986) found that equity did not increase over time, as would also be predicted by the theory. Nor did the researchers find that relationships which ended and those which continued differed in terms of equity, a further prediction of equity theory. Other variables (e.g. self-disclosure page 120) were **significantly** more important.

This undermines the **validity** of equity theory because equity does not play the role in relationship (dis)satisfaction that is predicted.

Cultural limitations

One limitation is that equity theory may not apply to all cultures.

Katherine Aumer-Ryan *et al*. (2007) found that there are cultural differences in the link between equity and satisfaction. Couples from an **individualist culture** (US) considered their relationships to be most satisfying when the relationship was equitable, whereas partners in a **collectivist culture** (Jamaica) were most satisfied when they were overbenefitting. This was true of both men and women, so cannot be explained by gender differences.

This suggests that the theory is limited because it only applies to some cultures.

Individual differences

Another limitation is that not all partners in romantic relationships are concerned about achieving equity.

Richard Huseman *et al*. (1987) suggest that some people are less concerned about equity than the 'norm'. They describe some partners as *benevolents*, who are prepared to contribute more to the relationship than they get out of it (underbenefit). Others are *entitleds* who believe they deserve to overbenefit and accept it without feeling distressed or guilty. In both cases such individuals have less concern about equity than the theory predicts.

This shows that a desire for equity varies from one individual to another and is not a universal feature of romantic relationships.

Evaluation eXtra

Equity – cause or effect?

There is research showing that lack of equity is a cause of dissatisfaction in relationships. For example Utne *et al*. (above) found both overbenefitting and underbenefitting (inequity) led to dissatisfaction.

However, other research shows the opposite direction of cause and effect. Nancy Grote and Margaret Clark (2001) argue that, as soon as partners start monitoring each other's contributions, this is a sign of dissatisfaction. Once dissatisfaction sets in, partners notice inequities and become even more dissatisfied – a 'cycle of misery'.

Consider: *Is inequity a cause or effect of relationship dissatisfaction?*



If we perceive inequity in our relationships, rather than doing something concrete about it, we might just settle for adjusting our expectations – a cognitive solution.

Apply it Concepts — Under the thumb?

Ricky and Carlos have been together for five years and recently got married. Some of their friends were quite surprised they did because they feel that Ricky treats Carlos as a bit of a 'doormat'. When they've challenged Carlos about this in the past, he just says that Ricky is worth it. Carlos doesn't seem to mind. He loves Ricky and wants to do the very best for him, even if it means putting himself last.

Question

Can equity theory adequately account for Ricky and Carlos's relationship? Explain your answer.

Apply it Methods — When inequity strikes ...

A relationships researcher intended to carry out an observational study of how long-term couples distribute rewards and costs. She wanted to know if men or women are more concerned about the equity of rewards and costs. She conducted a pilot study by setting up video cameras in the homes of five couples to record their daily interactions. Two independent observers then analysed the recordings to identify reward-related and cost-related behaviours.

Questions

1. Suggest *three* **operationalised behavioural categories** the observers could use to identify reward-related and cost-related behaviours. (*3 marks*)
2. Explain what is meant by **event sampling** in relation to this study. (*2 marks*)
3. The observers recorded each reward-related and cost-related behaviour as they occurred. Identify the **level of measurement** used and explain your answer. (*2 marks*)
4. What is a **pilot study** and why might one be useful in this research? (*3 marks*)
5. **Inter-observer reliability** was low in this pilot study. Explain what the researcher could do to improve the reliability of the observations before carrying out the main observational study. (*3 marks*)

Check it

1. Explain what is meant by 'equity' in relation to romantic relationships. *[2 marks]*
2. Briefly outline the equity theory of romantic relationships. *[4 marks]*
3. Explain the difference between social exchange theory and equity theory of romantic relationships. *[6 marks]*
4. Discuss the equity theory of romantic relationships. *[16 marks]*

Theories of romantic relationships: Rusbult's investment model

The specification says...

> Theories of romantic relationships: Rusbult's investment model of commitment, satisfaction, comparison with alternatives and investment.

Perhaps there is more to romantic relationships than just the balance of rewards and costs. Perhaps we're not even that bothered about whether the relationship is fair.

The investment model emphasises the central importance of commitment in relationships. Caryl Rusbult devised the model to address the limitations of social exchange theory.

Key terms

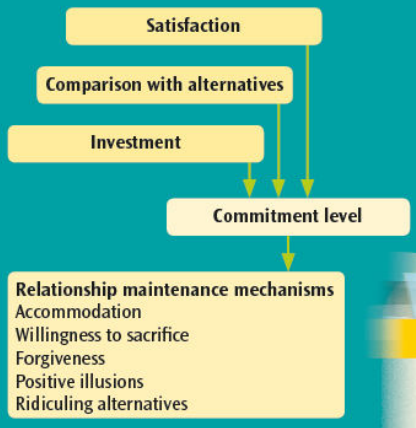
Commitment A romantic partner's intention or desire to continue a relationship, reflecting a belief that the relationship has a viable long-term future.

Satisfaction The extent to which romantic partners feel the rewards of a relationship exceed the costs.

Comparison with alternatives A judgement that partners make concerning whether a relationship with a different partner would bring more rewards and fewer costs.

Investment The resources associated with a romantic relationship which partners would lose if their relationship were to end.

Rusbult's investment model



Rusbult's investment model

According to Rusbult *et al.* (2011), **commitment** depends on three factors (see diagram, bottom left). Because the investment model is a development of **social exchange theory** (SET), two of these factors – satisfaction and comparison with alternatives – are very similar to elements of that earlier theory discussed on page 126.

Factor 1: Satisfaction

Satisfaction is based on the concept of the **comparison level** (CL). A satisfying relationship is judged by comparing rewards and costs, and is seen to be profitable if it has many rewards (e.g. support, sex, companionship) and few costs (e.g. conflicts, anxiety). Each partner is generally satisfied if they are getting more out of the relationship than they expect based on previous experience and social norms.

Factor 2: Comparison with alternatives

As we've already seen in social exchange theory, a **comparison with alternatives** (CLalt) results in romantic partners asking themselves, 'Could my needs be better met outside my current relationship? Are the alternatives more rewarding and less costly?'. Alternatives include not just relationships with other people, but the possibility of having no romantic relationship at all.

Factor 3: Investment

Rusbult *et al.* realised that the CL and CLalt derived from SET are not enough to explain commitment. If they were, then many more relationships would end as soon as either the costs outweighed the rewards (representing a loss) or more attractive alternatives presented themselves. Therefore a crucial third factor was introduced that influences commitment – **investment**.

An investment can be understood as anything we would lose if the relationship were to end. Rusbult argues that there are two major types of investment:

- *Intrinsic investments* are any resources we put directly into the relationship. They can be tangible things such as money and possessions. They can also be resources less easy to quantify (intangibles) such as energy, emotion and **self-disclosures** (see page 120).
- *Extrinsic investments* are resources that previously did not feature in the relationship, but are now closely associated with it. Tangibles include possessions bought together (for example, a car), mutual friends and children. A good example of an intangible is shared memories.

So putting these all together – if the partners in a relationship experience high levels of satisfaction (because they are getting many rewards with few costs) and the alternatives are less attractive and the sizes of their investment are increasing, then we can confidently predict that partners will be committed to the relationship.

Satisfaction versus commitment

Rusbult *et al.* (2011) argued that commitment is the main psychological factor that causes people to stay in romantic relationships, with satisfaction a contributory factor. This is an important distinction, because it can help to explain why dissatisfied partners may choose to stay in a relationship – it's because they are committed to their partner. But why are they so committed? That's because they have made an investment that they do not want to see go to waste. Therefore they will work hard to maintain and repair a damaged relationship, especially when it hits a rough patch.

Relationship maintenance mechanisms

Commitment expresses itself in everyday maintenance behaviours. According to the model, enduring partners do not engage in tit-for-tat retaliation but instead promote the relationship (accommodation). They also put their partner's interests first (willingness to sacrifice), and forgive them for serious transgressions (forgiveness).

There is also a cognitive element to relationship maintenance and repair. Committed partners think about each other and potential alternatives in specific (and predictable) ways. They are unrealistically positive about their partner (positive illusions), and negative about tempting alternatives and other people's relationships (ridiculing alternatives), much more so than less committed partners.

Apply it

Concepts

Should I stay or should I go?

Christy feels she is trapped in an unhappy relationship. She seems to be the one who always does everything around the house. Her needs always come second. She remembers being treated much better in her previous relationships. On the other hand, at least she has somewhere to live, and she really hates the idea of being on her own. Plus she has put a lot into the relationship. She came into it with a lot of stuff, including the house, and she still remembers the good times she and her partner used to have.

Questions

1. Use the investment model to explain why Christy continues in the relationship.
2. How does the model predict she will behave in the future?

Evaluation

Research support

One strength of the investment model is support from a **meta-analysis** by Benjamin Le and Christopher Agnew (2003).

They reviewed 52 studies, from the late 1970s to 1999, which together included about 11,000 participants from five countries. They found that satisfaction, comparison with alternatives and investment size all predicted relationship commitment. Relationships in which commitment was greatest were the most stable and lasted longest. These outcomes were true for both men and women, across all cultures in the analysis, and for homosexual as well as heterosexual couples.

This suggests there is validity to Rusbult's claim that these factors are universally important features of romantic relationships.

Counterpoint Strong **correlations** have been found between all the important factors predicted by the investment model. For example most of the studies in Le and Agnew's meta-analysis were correlational. However, correlational studies do not allow us to conclude that the factors identified by the model *cause* commitment in a relationship. It could be that the more committed you feel towards your partner, the more investment you are willing to make in the relationship, so the direction of causality may be the reverse of that suggested by the model.

Therefore it is not clear that the model has identified the *causes* of commitment rather than factors that are associated with it.

Explains abusive relationships

Another strength is that the model is an explanation of relationships that involve intimate partner violence (IPV, commonly known as 'abusive relationships').

Why does any rational person subjected to IPV stay in such a relationship? Caryl Rusbult and John Martz (1995) studied domestically abused women at a shelter and found that those most likely to return to an abusive partner (i.e. those who presumably were the most committed) reported having made the greatest investment and having the fewest attractive alternatives. These women were dissatisfied with their relationships but still committed to them.

Therefore the model shows that satisfaction on its own cannot explain why people stay in relationships – commitment and investment are also factors.

Oversimplifies investment

One limitation of the model is that it views investment in a simplistic one-dimensional way.

Wind Goodfriend and Christopher Agnew (2008) point out that there is more to investment than just the resources you have already put into a relationship. In the early stages, partners will have made very few actual investments (they may not even live together). Goodfriend and Agnew extended Rusbult's original model by including the investment partners make in their *future plans*. They are motivated to commit to each other because they want to see their cherished plans for the future work out.

This means the original model is limited because it fails to recognise the true complexity of investment, especially how planning for the future influences commitment.

Evaluation eXtra

Perception versus reality

The model is supported by self-report methods (e.g. questionnaires) which can be influenced by biases and subjective beliefs of respondents.

However, these may be appropriate methods to measure investment and comparison with alternatives because what determines commitment to a relationship is not the objective reality. What may matter more is what a person believes or perceives (e.g. one partner thinks they have made a big investment but that isn't objectively the case).

Consider: *Is the use of self-report methods a problem for the investment model?*



It seems the factors that lead to commitment in a relationship are just as important to gay couples as they are to straight partners.

Apply it Concepts — Why stay?

Every day over the last two years, Marina has wanted out of her marriage. They were both really happy in the early days, but it wasn't long before Marina's husband started trying to control her, always wanting to know where she had been, who with and what she was doing. Marina has left him twice, but came back. Her friends, who she sees rarely these days, don't understand why she doesn't just leave for good, before it's too late.

Question

Use the investment model to explain why Marina stays in an abusive relationship.

Apply it Methods — How's my investment?

A researcher decided to carry out a study to test the investment model of romantic relationships: 100 participants completed a self-report *Relationships investment scale* (RIS). The RIS produced an investment score for each participant on a scale between 0 (no investment made in the relationship) and 40 (extreme degree of investment).

The researcher calculated some measures of central tendency for the RIS scores. The mean of the investment scores was 17.3, the median was 19, and the mode was 26.

Questions

1. Identify an alternative method that could have been used to collect data about investment in this study. Explain why this might be a better method than a **questionnaire**. (*4 marks*)
2. Sketch a graph to show how the investment scores in the study were distributed. Carefully label the axes and mark on it the positions of the **mean**, the **median** and the **mode**. (*3 marks*)
3. What kind of **distribution** does your graph show? (*1 mark*)
4. The report of this study was eventually published in a journal after being subjected to **peer review**. Explain why peer review is an important part of the scientific process. (*4 marks*)

Check it

1. In relation to the investment model of romantic relationships, explain what is meant by 'investment' **and** 'comparison with alternatives'. *[2 marks + 2 marks]*
2. Briefly outline Rusbult's investment model of romantic relationships. *[4 marks]*
3. Explain the difference between Rusbult's investment model and social exchange theory. *[6 marks]*
4. Describe **and** evaluate Rusbult's investment model of romantic relationships. *[16 marks]*

Theories of romantic relationships: Duck's phase model

The specification says...

Theories of romantic relationships: Duck's phase model of relationship breakdown: intra-psychic, dyadic, social and grave dressing phases.

It's a fact of life that even once-strong relationships come to an end, and for all sorts of reasons: lack of communication, disinterest, neglect, betrayal. But can we identify any patterns in the breakdown process? Steve Duck (1997) believes we can and has devised a comprehensive model of relationship breakdown that is widely accepted.

Key term

Phase model of relationship breakdown An explanation of the stages people go through when their relationship is not working. Once one partner is dissatisfied, there are four phases in the process, each with a different focus: intra-psychic, dyadic, social and grave dressing.



'Should I stay or should I go?' Couples in the early stage of relationship breakdown spend a lot of time mulling things over in their own minds.

Apply it
Concepts

Breaking up, phase by phase

Karisma and Sanjay had been together for five years before they realised they weren't talking to each other much anymore. And when they did, there were lots of arguments and complaints. Eventually, family and friends became involved and Karisma and Sanjay both found out things they didn't know about each other. Towards the end, they spent a lot of time criticising and blaming each other to their friends.

Questions

1. Identify the phases of Duck's model in the account above.
2. Use the model to explain how Karisma and Sanjay's relationship could have been saved at various points in the breakdown process.

Duck's phase model of relationship breakdown

Steve Duck (2007) proposed a **phase model of relationship breakdown**. He argued that the ending of a relationship is not a one-off event but a process that takes time and goes through four distinct phases. Each phase is marked by one partner (or both) reaching a 'threshold', a point at which their perception of the relationship changes (usually for the worse). The road to break-up begins once a partner realises that they are dissatisfied with the relationship and distressed about the way things are going.

Intra-psychic phase

Threshold: 'I can't stand this anymore', indicating a determination that something has to change.

The focus of this phase is on cognitive processes occurring within the individual. The dissatisfied partner worries about the reasons for his or her dissatisfaction, centring mostly on their partner's shortcomings. The partner mulls their thoughts over privately, and may share them with a trusted friend. They weigh up the pros and cons of the relationship and evaluate these against the alternatives (including being alone). They begin to make plans for the future.

Dyadic phase

Threshold: They eventually come to the conclusion, 'I would be justified in withdrawing'.

The focus here is on interpersonal processes between the two partners. There comes a point when they cannot avoid talking about their relationship any longer. There is a series of confrontations in which the relationship is discussed and dissatisfactions are aired. These are characterised by anxiety, hostility, probably complaints about lack of equity, resentment over imbalanced roles and a rethinking of the commitment that kept the partners together. There are two possible outcomes – a determination to continue breaking up the relationship, or a renewed desire to repair it. But if the rescue attempts fail, another threshold is reached.

Ironically, self-disclosures may become deeper and more frequent in this phase as partners express thoughts and feelings they had been withholding in the intra-psychic phase.

Social phase

Threshold: The dissatisfied partner concludes, 'I mean it'.

The focus is now on wider processes involving the couple's social networks. The break-up is made public. Partners will seek support and try to forge pacts. Mutual friends find they are expected to choose a side. Gossip is traded and encouraged. Some friends provide reinforcement and reassurance ('I always said you were too good for him'). Others will place the blame on one partner or the other. Some may hasten the end of the relationship by providing previously secret information ('I didn't want to mention this but . . . '). Still others may pitch in and try to help repair the relationship (perhaps by acting as a go-between). This is usually the point of no return – the break-up takes on a momentum driven by social forces.

Grave dressing phase

Threshold: 'It's now inevitable'.

The focus of this phase is on the aftermath. Once the relationship is dead, the time comes to bury it, by 'spinning' a favourable story about the breakdown for public consumption. This allows the partners to save face and maintain a positive reputation, usually at the expense of the other partner, showing them in a bad light. Gossip plays an important role in this phase. It is crucial that each partner tries to retain some 'social credit' (La Gaipa 1982) by blaming circumstances, your partner or other people, or everything and everyone but themselves.

Grave dressing also involves creating a personal story you can live with, which may differ from the public one. This is more to do with tidying up memories of the relationship, with a certain degree of rewriting of history. The traits you found endearing in your partner at the start of the relationship are now reinterpreted in a much more negative fashion. A 'wild and unpredictable nature' is now seen as an 'irresponsible failure to settle down'.

The dissatisfied partner finally reaches the threshold, *'Time to get a new life'.*

Evaluation

Real-world application

One strength of the model is that it suggests ways in which relationship breakdown can be reversed.

The model is useful because it recognises that different repair strategies are more effective at some points in the breakdown than at others. For example, Duck (1994) recommends that people in the intra-psychic phase could be encouraged to focus their worrying on the positive aspects of their partner. Also, as a feature of the dyadic phase is communication, any attempt to improve this and wider social skills could be beneficial in fostering greater stability in the relationship.

These insights can be used in relationships counselling to help people through difficult times.

Counterpoint The model is based on research into relationship breakdown in **individualist cultures**, especially the US. According to Fathali Moghaddam *et al.* (1993), relationships in individualist cultures are generally voluntary and frequently come to an end (for example, divorce). But relationships in **collectivist cultures** are less easy to end and involve the wider family. In fact the whole conception of a romantic relationship differs between cultures.

This means the model's application would not be useful in all cultures.

An incomplete model

One limitation is that the original model described on this spread is an incomplete explanation of breakdown.

Duck, together with Stephanie Rollie (2006), added a fifth phase after grave dressing, the *resurrection phase*. Ex-partners apply to future relationships the experiences gained from their recently-ended one. The researchers also argue that progression from one phase to the next is not inevitable because it is possible to return to an earlier point in any phase. Finally, the processes that occur in relationship breakdown (e.g. the role of gossip in the social phase) are more important than linear movement from one phase to the next.

Therefore the original model does not account for the complexity of breakdown and its dynamic nature.

Early phases are less understood

Another limitation of the model (including the newer version) is that it underexplains the early phases of breakdown.

This is because much of the research is retrospective. Participants in research studies generally report their experiences some time after the relationship has ended, so what they recall might not always be accurate or reliable. This is especially true of the early stages – by definition the early phases occur 'longer ago'. Partners can be in the intra-psychic phase for a long time so recall of it may be particularly distorted.

This means that the model may not explain the early part of the breakdown process as well as later phases.

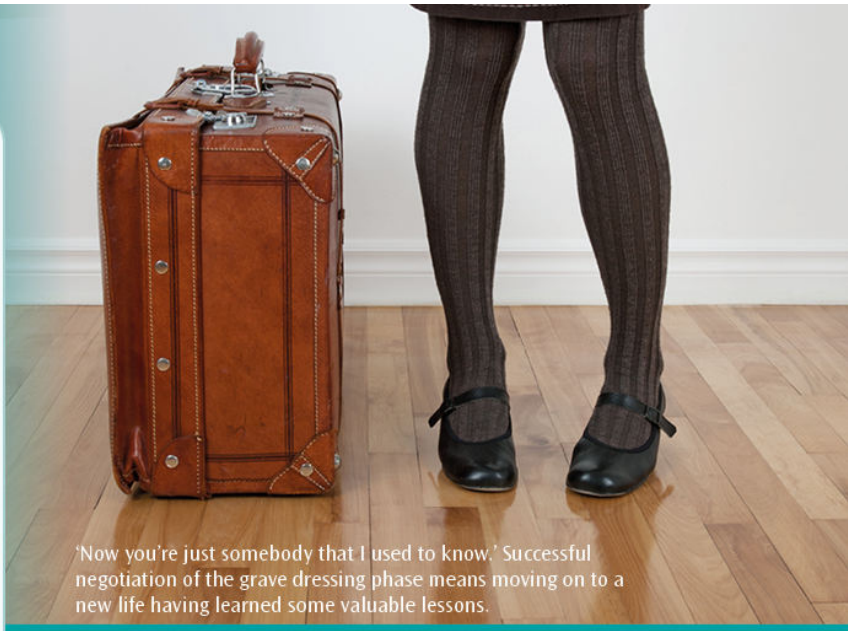
Evaluation eXtra

Description rather than explanation

Duck's model describes the process of relationship breakdown through various phases. It is focused on *what* happens rather than looking at the factors that caused the breakdown.

In contrast, Diane Felmlee's (1995) fatal attraction hypothesis focuses on *why*. She suggests that the trait that led to initial attraction may later be seen as undesirable. For example, one partner may become dissatisfied because her partner's 'great sense of humour' later becomes 'He can't take anything seriously'.

Consider: *Which approach is better, or can they be combined?*



'Now you're just somebody that I used to know.' Successful negotiation of the grave dressing phase means moving on to a new life having learned some valuable lessons.

Apply it Concepts — I will survive

Katie and Tom were both unhappy with their relationship, which just seemed to go from bad to worse. If it had been up to Tom things would have drifted on and on. But Katie decided enough was enough and left.

Question

Some research shows that how ex-partners react to a break-up depends on the role they played in bringing the relationship to an end. Explain how you think Katie and Tom would have felt and behaved.

Apply it Methods — A case study

A researcher into the psychology of relationships decided to investigate the reasons why romantic relationships break down. She carried out a case study of a divorced couple who had been married for 25 years. She used various techniques for collecting data about the process the couple went through before and after their marriage ended.

Questions

1. Describe *one* technique that the researcher could have used to collect data in this **case study**. (*2 marks*)
2. Explain *one* strength of conducting a case study. (*2 marks*)
3. The researcher wrote up the case study in a report for publication in a scientific journal. What is the purpose of the method section of such a report? (*2 marks*)
4. How could the researcher maintain her participants' **confidentiality** when her report is published? (*3 marks*)
5. Explain why **replication** of the study would be beneficial. (*3 marks*)

Check it

1. Briefly outline Duck's phase model of relationship breakdown. *[4 marks]*
2. Identify **and** discuss **one** stage in Duck's phase model of relationship breakdown. *[4 marks]*
3. Evaluate Duck's phase model of relationship breakdown. *[6 marks]*
4. Describe **and** evaluate Duck's phase model of relationship breakdown. *[16 marks]*

Virtual relationships in social media

The specification says...

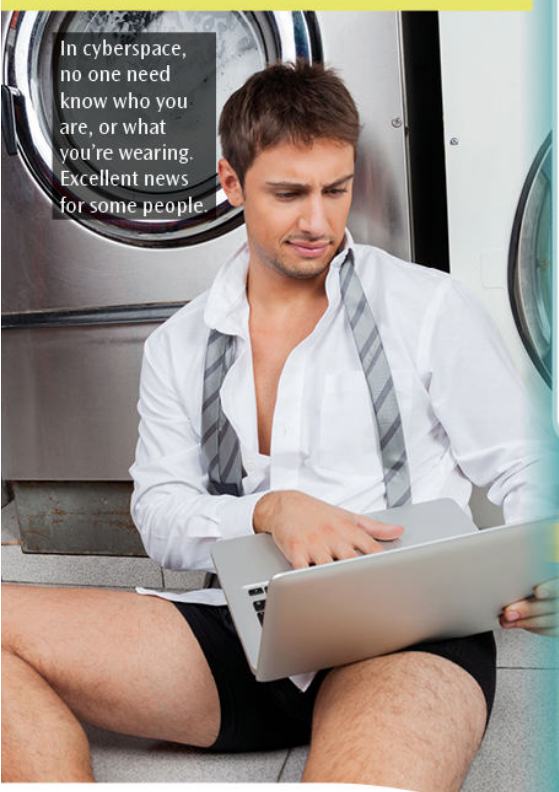
Virtual relationships in social media: self-disclosure in virtual relationships; effects of absence of gating on the nature of virtual relationships.

As internet use has increased, psychologists have become more interested in online or virtual relationships, especially in terms of communication. The term 'virtual relationships' encompasses a wide variety of electronic communication methods by which relationships can be formed and maintained, for example, email, instant messaging, chat rooms, texts, and particularly social networking sites such as Facebook, Twitter and TikTok.

Key terms

Self-disclosure Revealing personal information about yourself. Romantic partners reveal more about their true selves as their relationship develops. These self-disclosures about one's deepest thoughts and feelings can strengthen a romantic bond when used appropriately.

Absence of gating Face-to-face (FtF) relationships often fail to form because of obstacles such as facial disfigurements that some people might find off-putting. These barriers or 'gates' are absent in the virtual world allowing relationships to begin when they might not offline.



In cyberspace, no one need know who you are, or what you're wearing. Excellent news for some people.

Virtual relationships in social media

Self-disclosure in virtual relationships

Psychologists have long known that **self-disclosure** is a crucial feature of face-to-face (FtF) relationships in the offline world, as we discussed earlier in this chapter (page 120). In recent years researchers have turned their attention to the role of self-disclosure in social media-based relationships. How does self-disclosure operate in virtual relationships? There are two major and contrasting theories.

Reduced cues theory According to Lee Sproull and Sara Kiesler (1986), virtual relationships are less effective than FtF ones because they lack many of the cues we normally depend on in FtF interactions. These include nonverbal cues such as our physical appearance and especially cues to our emotional state (e.g. facial expressions, tone of voice).

This reduces a person's sense of individual identity in virtual relationships (**de-individuation**), which in turn leads to disinhibition. Many people then feel freer to communicate in blunt and even aggressive ways. People are unlikely to want to express their real thoughts and feelings to someone who is so impersonal.

The hyperpersonal model Joseph Walther (1996, 2011) argues that virtual relationships can be *more* personal and involve *greater* self-disclosure than FtF ones. This is because virtual relationships can develop very quickly as self-disclosure happens earlier, and once established they are more intense and intimate. There are two key features of hyperpersonal self-disclosure in virtual relationships.

1. The sender of a message has greater control over what to disclose and the cues they send than they would in an FtF situation. This is selective self-presentation. The sender manipulates their self-image to present themselves in an idealised way. To achieve this, self-disclosures can be both intensely truthful (hyperhonest) and/or intensely false (hyperdishonest).
2. The receiver gains a positive impression of the sender, they may give feedback (e.g. respond to a Facebook post) that reinforces the sender's selective self-presentation ('Wow, you sound like a really happy person').

Another factor that promotes online self-disclosure and makes virtual relationships hyperpersonal is anonymity. John Bargh *et al.* (2002) point out that the outcome of this is like the *strangers on a train effect* in FtF relationships. When you're aware that other people do not know your identity, you feel less accountable for your behaviour. So you may well disclose more about yourself to a stranger than to even your most intimate partner.

Effects of absence of gating in virtual relationships

What is a 'gate'? In this context, according to Katelyn McKenna and John Bargh (1999), a gate is any obstacle to forming a relationship. FtF interaction is gated, in that it involves many features that can interfere with the early development of a relationship (or guide it in one direction and away from others). Examples of gates include physical unattractiveness, facial disfigurement, a stammer and social anxiety (shyness, blushing, etc.).

Benefits and drawbacks A key feature of virtual relationships is that most of these gates are absent. This means a virtual relationship can develop to the point where self-disclosure becomes more frequent and deeper. Therefore the relationship can 'get off the ground' in a way that is less likely to happen face-to-face.

Absence of gating works by refocusing attention on self-disclosure and away from superficial and distracting features. In a virtual relationship I am more interested in what you tell me than in what you look and sound like.

A benefit of gates being absent is that the individual is freed to be more like their 'true selves' (more so than in FtF interactions). On the other hand, there is scope for people to create untrue identities and deceive people in ways that they could never manage FtF. A person can change their gender or age, an introvert become an extravert, a plain person the world's most desirable sex symbol. Perhaps the ultimate expression of this ungated existence is *Second Life*, where anyone can create any kind of avatar to represent themselves in a virtual reality (see Apply it, below).

Apply it

Concepts Second Life

Amy and David met in an internet chat room. They soon got together FtF and married two years later. They both had a virtual existence on *Second Life* – Amy was 'Laura Skye' and David was 'Eddie Barmy'. Laura and Eddie married online soon after Amy and David. Three years later, Laura found out Eddie was having avatar sex with 'Modesty McDonnell', a nightclub hostess. Unsurprisingly, Laura and Eddie got divorced in *Second Life*. But so did Amy and David, in their offline lives. As Amy said, 'It may have started online, but it existed entirely in the real world and it hurts just as much.' (Based on a true story.)

Question

Explain Amy and David's relationship using the concepts on this spread.

Evaluation

Lack of support for reduced cues

One limitation of reduced cues theory is that online nonverbal cues are different rather than absent.

Joseph Walther and Lisa Tidwell (1995) point out that people in online interactions use other cues, such as style and timing of messages. For instance, taking time to reply to a social media status update may be a more intimate act than an immediate response. But taking too much time could be interpreted as a snub. So there are nuances in virtual relationships that are just as subtle as in FtF relationships. Acronyms (e.g. LOL), emoticons and emojis can all be used as effective substitutes for facial expressions and tone of voice.

This is hard for reduced cues theory to explain because it means virtual relationships can be just as personal as FtF ones.

Lack of support for the hyperpersonal model

One limitation of the hyperpersonal model is that it is challenged by the findings of **meta-analysis**.

Erin Ruppel *et al.* (2017) carried out a meta-analysis of 25 studies that compared self-disclosures in FtF and virtual interactions. They found that self-report studies showed that the frequency, breadth and depth of self-disclosures were all greater in FtF relationships. On the other hand experimental studies showed no significant differences between FtF and virtual relationships in terms of self-disclosure.

This contradicts the hyperpersonal model's view that the greater intimacy of virtual relationships should lead to more and deeper self-disclosures than in FtF relationships.

Counterpoint However there is some evidence that FtF and virtual relationships do differ in the *type* of self-disclosures used. Monica Whitty and Adam Joinson (2009) summarise evidence showing how self-presentation is manipulated in virtual relationships. For example, questions asked in online discussions tend to be very direct, probing and intimate (hyperhonest). This is quite different from FtF conversations, which often feature 'small talk'. Self-presentation online can also be hyperdishonest, for instance when people invent attractive personal qualities for their online dating profiles.

This supports the model's claims about hyperhonest and hyperdishonest self-disclosures and shows there are differences between FtF and virtual relationships.

Support for absence of gating

Another strength is that shy, lonely and socially anxious people find virtual relationships especially valuable.

Katelyn McKenna and John Bargh (2000) looked at online communication by shy, lonely and socially anxious people. They found that these people were able to express their 'true selves' more than in FtF situations. Of the romantic relationships that initially formed by shy people online, 71% survived at least two years. This compares well with relationships for shy people formed in the offline world (e.g. 49% in a study by Kirkpatrick and Davis 1994).

This suggests that shy people do benefit online presumably because the gating that obstructs FtF relationships is absent online.

Evaluation eXtra

Online versus multimodal

Two theories on this spread (hyperpersonal model and absence of gating) try to explain how there is more self-disclosure in virtual relationships than FtF because of certain features unique to online relationships (e.g. selective self-presentation).

But Walther (2011) argues that these theories fail to take into account that all relationships are multimodal. That is, we conduct them both online and offline rather than 'either/or'. What we choose to disclose in virtual relationships is influenced by our offline interactions, and vice versa.

Consider: *Does Walther's view mean we should ignore the earlier theories?*



A *Second Life* avatar. For some people, just like real life, only more so.

Apply it Concepts — A virtual existence

Rafi is a very shy and introverted young man who has great difficulty in making conversation, especially with women he likes. He blushes, stammers and finds it hard to say the right words. But when he posts on social media sites and chat rooms, he's a different person. Other people online seem to like and respect him.

Question

Using the absence of gating theory, explain why Rafi's online and offline lives are so contrasting.

Apply it Methods — A liking experiment

A psychologist recruited 50 participants to investigate virtual relationships. There were two tasks for the participants to perform. In one, they had to interact with another person online in a 10-minute exchange of messages. In the other task, they interacted with someone face-to-face in a 10-minute discussion. After completing both tasks, the participants had to rate how much they liked the other person on a scale from 0 (didn't like them at all) to 10 (liked them very much).

Questions

1. What were the **operationalised independent** and **dependent variables**? (*1 mark + 1 mark*)
2. The psychologist realised that she would need to use **counterbalancing**. Explain how she could have done so, and why it was necessary. (*4 marks*)
3. Explain how **demand characteristics** might have affected the study. (*2 marks*)
4. Explain how *one* factor in this study might have affected its **external validity**. (*3 marks*)
5. Explain *one or more* **ethical issues** that the psychologists should have taken into account in this study. (*4 marks*)

Check it

1. In relation to virtual relationships, explain what is meant by 'self-disclosure'. *[2 marks]*
2. Explain the effects of absence of gating on virtual relationships. *[4 marks]*
3. Outline findings from research into self-disclosure in virtual relationships. *[4 marks]*
4. Describe **and** evaluate research into virtual relationships in social media. *[16 marks]*

Parasocial relationships

The specification says...

Parasocial relationships: levels of parasocial relationships, the absorption addiction model and the attachment theory explanation.

Psychologists are interested in the attraction of celebrity and have tried to explain parasocial relationships. These are defined by Donald Horton and Richard Wohl (1956) as those attachments in which the 'fan' knows all about the celebrity, but the celebrity doesn't even know the fan exists. It's not just celebrities that can be the subject of a parasocial involvement. It could be a team, an organisation, a brand or a fictional character. It could even be anyone who stands out in a community enough to make genuine interaction difficult (such as a teacher).

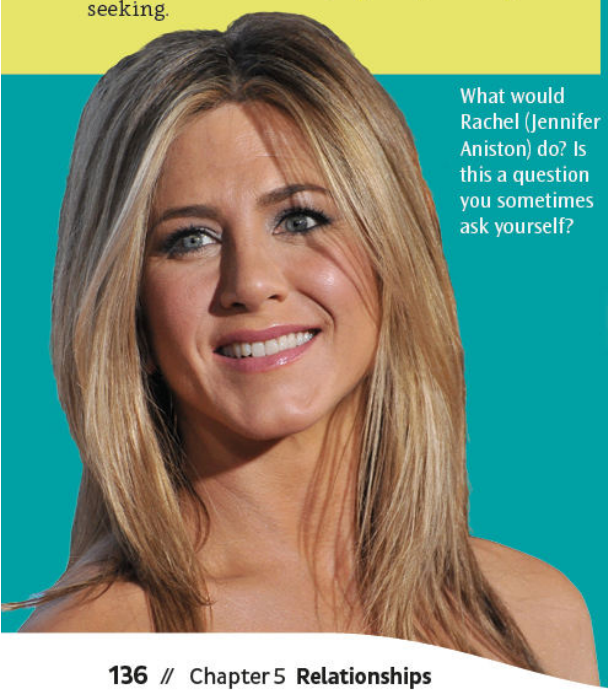
Key terms

Parasocial relationship The prefix 'para' means 'resembling' so parasocial relationships are those which are similar to 'normal' relationships but lack a key element. They are a one-sided, unreciprocated relationship, usually with a celebrity, on which the 'fan' expends a lot of emotional energy, commitment and time.

Levels of parasocial relationships A three-step description of one-sided relationships in terms of increasing strength from entertainment-social to intense-personal to borderline-pathological.

Absorption addiction model Explains parasocial relationships as total preoccupation in a celebrity's life, plus an addictive striving after a stronger involvement.

Attachment theory An explanation of how an enduring emotional bond forms between two people that persists over time. Leads to certain behaviours such as clinging and proximity-seeking.



What would Rachel (Jennifer Aniston) do? Is this a question you sometimes ask yourself?

Parasocial relationships

Levels of parasocial relationships

Lynn McCutcheon and his colleagues (2002) developed the *Celebrity attitude scale* (CAS). This was used in a large-scale survey by John Maltby *et al.* (2006) who identified three **levels of parasocial relationship**. Each level describes the attitudes and behaviours linked to ever more extreme forms of celebrity worship.

- *Entertainment-social* – this is the least intense level of celebrity worship. At this level celebrities are viewed as sources of entertainment and fuel for social interaction. For example, friends with an interest in soap operas might enjoy discussing stories in *OK* magazine about actors on *EastEnders*. David Giles (2002) found that parasocial relationships were a fruitful source of gossip in offices.
- *Intense-personal* – this is an intermediate level which reflects a greater personal involvement in a parasocial relationship with a celebrity. A fan of Kim Kardashian might have frequent obsessive thoughts and intense feelings about her, perhaps even considering her to be a 'soulmate'.
- *Borderline-pathological* – this is the strongest level of celebrity worship, featuring uncontrollable fantasies and extreme behaviours. These might include spending (or planning to spend) a large sum of money on a celebrity-related object, or being willing to perform some illegal act on the celebrity's say-so.

The absorption addiction model

McCutcheon (2002) linked the levels approach (above) to the deficiences people have in their own lives. For example, a person may have a low **self-esteem** and lack fulfilment in their everyday relationships. Someone who initially has an entertainment-social orientation to a certain celebrity may be triggered into more intense involvement by some personal crisis or stressful life event. The parasocial relationship allows them to 'escape from reality'.

As the name implies, the **absorption addiction model** has two components:

- *Absorption* – seeking fulfilment in celebrity worship motivates an individual to focus their attention as far as possible on the celebrity, to become preoccupied with the celebrity and identify with them.
- *Addiction* – just as with a physiological addiction to a psychoactive substance, the individual needs to increase their 'dose' in order to gain satisfaction. This may lead to more extreme behaviours and delusional thinking. For example, stalking a celebrity because they believe that the celebrity really wants to reciprocate their feelings, but someone – the celebrity's manager perhaps – is stopping the celebrity from getting involved.

Attachment theory explanation of parasocial relationships

Various psychologists have suggested that there is a tendency to form parasocial relationships in adolescence and adulthood because of **attachment** difficulties in early childhood. Bowlby's **attachment theory** (which was part of your Year 1 studies) suggested such early difficulties may lead to emotional troubles later in life. Mary Ainsworth (1979) identified two **attachment types** associated with unhealthy emotional development: **insecure–resistant** and **insecure–avoidant**.

Insecure–resistant types are most likely to form parasocial relationships as adults. This is because they seek to have unfulfilled needs met, but in a relationship that is not accompanied by the threat of rejection, break-up and disappointment that real-life relationships bring. Insecure–avoidant types, on the other hand, prefer to avoid the pain and rejection of relationships altogether, whether they be social or parasocial.

Apply it Concepts

A celebrity obsession

Stuart is 35 years old and a big fan of the *Harry Potter* books and films. He spends a lot of his spare time reading and watching them. He can't help it, but he frequently fantasises about actually being Harry Potter. He has spent a lot of money on his obsession, and it's fair to say that it is starting to interfere with some areas of his life. He enjoys joining in with online costume play (cosplay) sessions. He's not sure about attending conventions to meet other people face-to-face but he's thinking about it. He's actively trying to get hold of Daniel Radcliffe's mobile phone number.

Questions

1. Explain Stuart's behaviour in terms of the theories on this spread.
2. What do you think are the benefits and risks of his behaviour for Stuart?

Practical activity on page 139

Evaluation

Research support for levels

One strength of the levels 'model' is that its predictions are supported by research (predictive validity).

For instance, McCutcheon *et al.* (2016) used the CAS to measure level of parasocial relationships. They also assessed participants' problems in their intimate relationships. Participants who scored as borderline-pathological or intense-personal tended to experience a high degree of anxiety in their intimate relationships. People at the entertainment-social level generally did not (although even this level was associated with other relationship problems).

This suggests that 'celebrity-worshippers' can usefully be classified into three categories and that these are predictive of actual behaviour.

Support for absorption addiction model

One strength of the model is research showing a link between celebrity worship and body image.

The addiction-absorption model suggests that a deficiency in a person's life (such as poor body image) would predispose them to forming parasocial relationships. In one study, John Maltby *et al.* (2005) assessed boys and girls aged 14 to 16 years. The researchers were particularly interested in girls who reported an intense-personal parasocial relationship with an adult female celebrity whose body shape they admired. They found that the girls tended to have a poor body image. They speculated that this may contribute to the development of an eating disorder.

This supports the model's prediction of an association between poor psychological functioning and the level (type and intensity) of parasocial relationship.

Universal tendency

One strength of attachment theory is that it can explain why people all over the world have a desire to form parasocial relationships.

Juliet Dinkha *et al.* (2015) compared two contrasting cultures – a **collectivist** one (applies to Kuwait) and an **individualist** one (applies to the US). The researchers found that people with an insecure attachment type were the most likely to form intense parasocial relationships with TV personalities and characters (e.g. Rachel from *Friends*). This was true in both types of culture. In other words the 'driver' for forming a parasocial relationship is independent of cultural influences.

This supports the view that attachment type may be a universal explanation for the need to form parasocial relationships.

Counterpoint However, other evidence is not supportive. For example, McCutcheon *et al.* (2006) measured attachment types and celebrity-related attitudes in 299 American participants. The researchers found that attachment security did not affect the likelihood of forming a parasocial relationship with a celebrity. Participants with insecure attachments were no more likely to form such relationships than participants with secure attachments.

This shows that parasocial relationships are not necessarily a way of compensating for attachment issues.

Evaluation eXtra

Causation and correlation

McCutcheon *et al.*'s (2016) study (and many others) use correlational analysis. Such studies do not show causal relationships between variables. In this case, for instance, we cannot conclude that anxiety in relationships causes borderline-pathological parasocial involvement. The causal relationship could be in the other direction. Alternatively, a third factor, which was not measured in the study, could be the cause of both variables.

However, correlations (or natural experiments) can be valuable because they suggest links between variables even though they don't demonstrate causes. Such methods may be the only option we have when studying people's behaviour in their everyday lives.

Consider: *How should we treat data about parasocial relationships that has come from correlational research?*



For some people, a parasocial relationship can offer an escape from the harsh demands of everyday life.

Apply it Concepts — Addicted to soap?

Gloria and her friends enjoy watching soap operas. They all have their preferences but EastEnders features on all their lists. They frequently find themselves talking about the latest developments and the actors who play their favourite characters. Gloria isn't worried that it'll get out of hand because it's all good fun.

Questions

1. What level of parasocial relationship does this describe?
2. Under what circumstances do you think Gloria might develop a greater parasocial involvement?

Apply it Methods — Men, women and celebs

A psychologist was interested to see if there is a gender difference in the tendency to form parasocial relationships with celebrities. Ten men and ten women completed an *Attitudes towards celebrities* (ATC) scale. The scale measures the intensity of devotion towards a celebrity, from a score of 0 (no devotion at all) to 20 (extremely intense devotion).

Questions

1. Explain why the research method used in this study is a **quasi-experiment**. (*2 marks*)
2. Explain *one* strength and *one* limitation of this research method. (*2 marks + 2 marks*)
3. Explain how the psychologist could have checked the **validity** of the ATC scale. (*3 marks*)
4. The psychologist calculated some **descriptive statistics**, presented in Table 1. With reference to these figures, outline what the findings of the study seem to show. (*2 marks*)

Table 1 Scores on the ATC scale.

	Men's scores	Women's scores
Median	9.5	5.5
Range	6	11

Check it

1. Explain what is meant by 'levels of parasocial relationships'. *[4 marks]*
2. Outline the absorption addiction model of parasocial relationships. *[4 marks]*
3. Outline the attachment theory explanation of parasocial relationships. *[4 marks]*
4. Describe **and** evaluate **one or more** explanations of parasocial relationships. *[16 marks]*

Practical corner

The specification says...

> Knowledge and understanding of...research methods, practical research skills and maths skills. These should be developed through...ethical practical research activities.

In both a correlational study and a quasi-experiment, there's no manipulation of variables like you find in a true experiment. Sometimes, ethical or practical reasons mean that we can only measure variables and analyse how they relate to each other – no manipulation. The two investigations on this spread give you the opportunity to do just that, using questionnaires and participants' ratings.

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?



You need images of romantic partners to test the matching hypothesis. But don't make it too easy to guess who the couples are.

Practical idea 1: The matching hypothesis

The **matching hypothesis** is an explanation of relationship formation that puts physical attractiveness very much at the forefront of partner selection. However, in choosing romantic partners the matching hypothesis suggests we generally don't go for the most attractive person available. We compromise partner choice by taking into account our assessment of our own level of attractiveness.

So the aim of this practical is to test the prediction that most partners in a couple have a similar level of attractiveness to each other. A **correlational** research method is ideally suited to this aim. We expect to find a **significant positive correlation** between ratings of physical attractiveness given for each partner in a couple.

The practical bit

Designing your study

You will need to find images of ten romantic couples. There are many available on the internet, but your selection needs to follow some strict criteria. Don't use images of celebrities or any other couples your participants are likely to know. You need to be able to divide the images into separate individuals, in such a way that it's not obvious which ones go together. Ideally, there should be no cues for participants to work out which individuals belong together. For example, one potential **extraneous variable** is image backgrounds.

Because you are aiming to **standardise** your procedure, the images need to be as similar to each other as possible, for example, in terms of size and direction of pose. Images of couples getting married fit most of these criteria so are well worth considering. Limit your selection to heterosexual couples, within a narrow age range and all of the same ethnic grouping. This is purely for the sake of standardisation and because you are testing the original matching hypothesis. Once you have prepared the images of individual partners, they are well-suited to being presented to whole classes of students, for instance in a PowerPoint slideshow. Make sure you present them in a random order.

You should also construct a response sheet on which participants can note their ratings for each individual. Indicate on the response sheet the ID for each individual image (e.g. give each image a letter). Keep a careful record of which individuals are couples. Finally, decide on a rating scale of physical attractiveness, such as 1 to 10 (from 'not at all attractive' to 'extremely attractive'). Include the scale in your **standardised instructions** with a detailed explanation of what the participants need to do.

Ethical issues

Some participants might object to the whole business of rating physical attractiveness as shallow or degrading. You need to make it clear that anyone who does object for this or any other reason has the **right to withdraw** before the procedure begins. You should also obtain **informed consent**, so that participants can make a decision about whether or not to proceed.

You should also consider ethical issues in relation to the photographs you use – if they are selected from magazines you might decide this is acceptable because the photographs are in the public domain. If you take your own photographs, make sure people realise that you will be asking participants to rate the photographs for attractiveness.

Selecting your participants

You could, with the cooperation of a teacher, select whole classes **randomly** from the school or college register. But it's more likely that you will use an **opportunity sample** of available classes.

Analysing and presenting your data

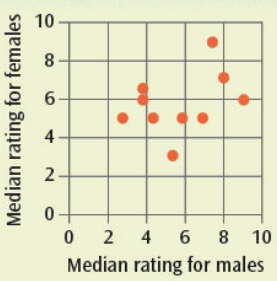
You need to calculate a **measure of central tendency** to represent the average attractiveness ratings for each male and female partner (i.e. 20 calculations in all if you have 20 pictures). You can present these in a table, with the figures for the partners in each couple alongside each other. You could then draw a **scattergram**. Each data point represents the average attractiveness ratings for each couple, with the male partner on one axis and the female partner on the other (i.e. 10 data points).

For **inferential analysis**, apply a statistical test to assess the relationship between the two sets of attractiveness ratings. Answering the questions below will help you decide which test to use.

Apply it Methods

The maths bit 1

1. What conclusions can you draw based on the **scattergram** on the right? (*3 marks*)
2. Explain why the **median** was used to calculate average attractiveness. (*2 marks*)
3. Which **statistical test** would you use to analyse the significance of the relationship in the scattergram? Give *two* reasons for your choice. (*1 mark + 2 marks*)
4. The appropriate statistical test was calculated and the result was **significant** at $p \leq 0.05$. What does this mean? (*2 marks*)



Graph showing attractiveness ratings for each couple.

Practical idea 2: Testing the absorption addiction model

The **absorption addiction model** has been used to explain how people form parasocial relationships (McCutcheon 2002). These are unreciprocated relationships, often formed with celebrities.

Our aim is to test the prediction that people form parasocial relationships as an escape from the reality of everyday living. To do this, we need to assume that people with stressful lives welcome some escape. Therefore we would expect that the degree of parasocial involvement is linked with how much stress a person experiences in their everyday lives – greater stress is associated with a more intense level of relationship.



Deep parasocial involvement can mean a lot of time spent dressing up as your favourite fictional character. But is this behaviour an attempt to escape from a stressful life?

The practical bit

Designing the study

This practical is a **quasi-experiment**, because the **independent variable** (IV) is pre-existing and not manipulated by you. The IV is the degree of life stress experienced by your participants, low or high. The **dependent variable** (DV) is the level of parasocial involvement – either social-entertainment (lower) or intense-personal (higher). You will need two **questionnaires** to establish the conditions of the IV and measure the DV.

The questionnaires

Fortunately there are standardised measures readily available on the internet. These are the *Celebrity attitude scale* (CAS) and the *College student's stressful events checklist* (CSSEC). You can find both of these using a search engine of your choice. However, both will need some alterations to make them more useful for this practical.

The CAS measures not only the two levels of parasocial involvement we are investigating, but a third called *borderline-pathological*. There is a risk that a degree of stress could be caused by asking participants to fill in items relating to this third level. So for ethical reasons, it would be advisable to remove them altogether. Use the scoring key provided with the scale to find out which items these are.

The CSSEC has been devised for use with American participants. There's no need to remove any items, but it would be useful to change some of the language to terms that would be more recognisable to UK students (e.g. *course* for *major*, *teacher* for *instructor*, *term* for *semester*). You should also remove any text that indicates how the scale is scored.

Ethical considerations

You will have removed the more distressing items on the CAS. But you should consider that the questions on the CSSEC are somewhat personal and potentially invasive. There is a chance that some participants could experience indignity or embarrassment. On the other hand, this is a standard questionnaire which has been used in countless research studies. Nevertheless, think about how you can counteract any potentially negative effects of such personal questioning. For instance, is there any need to collect participants' names? As each participant is going to complete two questionnaires, you need some way of matching them up, but this does not have to involve names. You should certainly think very carefully about how you are going to obtain informed consent and ensure that your participants are aware of their right to withdraw.

Analysing your data

You need to identify 'low stress' and 'high stress' participants on the basis of their CSSEC scores. The most straightforward way to do this is to use a cut-off point to divide the set of scores into two groups – high stress participants are those who score 225 or more, low stress is a score of 224 or less. You should have two parasocial involvement scores for each participant, one for *social-entertainment* and one for *intense-personal*. For each participant, take the highest of these two scores to indicate level of parasocial relationship.

Once you have classified each participant into their appropriate stress level group and parasocial level group, you should be able to complete a 2×2 contingency table like the one on the right (Table 1).

The maths bit

Overall, at least 10% of the marks in assessments for Psychology will require the use of mathematical skills and this is included in the requirement that at least 25–30% in total will involve research methods.

Don't avoid it!

Apply it
Methods

The maths bit 2

Table 1 below shows the number of participants in each category based on their CAS and CSSEC scores.

1. Using Table 1, calculate the totals for each row and each column and the overall total. (*5 marks*)
2. Draw a suitable graph to represent the data in the categories. Label the axes carefully and give the graph an appropriate title. (*3 marks*)
3. What type of graph have you drawn? Explain why you made this choice. (*1 mark + 2 marks*)
4. Calculate the frequencies in each cell as a percentage of the total frequency. (*4 marks*)
5. What would you conclude from these figures about the effect of stress on parasocial involvement? (*2 marks*)
6. Name the **statistical test** you think would be appropriate to analyse the data. Give *two* reasons why you have chosen this test. (*1 mark + 2 marks*)

Table 1 Number of participants in each stress/parasocial involvement category.

		Parasocial involvement	
		Social-entertainment	Intense-personal
Stress	Low	18	7
	High	11	14

Revision summaries

Evolutionary explanations for partner preferences

How our preferences for mates have evolved.

Sexual selection

Sexual selection
Genes selected that promote survival (natural selection), or successful reproduction (sexual selection).

Anisogamy
Male gametes are produced in large numbers, female gametes are relatively rare. This gives rise to two mating strategies.

Inter-sexual selection
Between (inter) the sexes. The preferred female strategy, select quality (e.g. genetic fitness).

Females invest more in offspring so choosy (Trivers), choices determine features passed on e.g. height, runaway process/sexy sons hypothesis (Fisher).

Intra-sexual selection
Within (intra) the sexes. The preferred male strategy, seeks quantity (sperm plentiful).

Males seek signs of fertility (e.g. youthfulness – narrow waist), compete for fertile females, pass on 'victorious' genes (e.g. larger body, aggression).

Evaluation

Research support for inter-sexual selection
75% of men agreed to sexual request from woman, 0% women agreed to man's request (Clark and Hatfield).

Counterpoint – sexual selection simplistic, male/female strategies similar when seeking long-term relationships (Buss and Schmitt).

Research support for intra-sexual selection
10,000 adults questioned in 33 countries, men seek signs of reproductive capacity (e.g. youth), women want resources (Buss).

Social and cultural influences underestimated
Rapid changes in partner preferences due to changing social norms (e.g. contraception, workplace roles) (Bereczkei *et al.*).

Evaluation extra: Sexual selection and homosexuality
Some argue that sexual selection theory can't explain preferences of homosexual men and women, but homosexual male/female strategies differ just like heterosexuals (Lawson *et al.*).

Factors affecting attraction in romantic relationships

Self-disclosure

Revealing personal and sensitive information.

The theory

Social penetration theory
Partners penetrate more deeply into each other's lives with self-disclosure, a sign of trust (Altman and Taylor).

Breadth and depth of self-disclosure
Layers of on onion metaphor, at start reveal lots of superficial information (breadth) but then move deeper. Depenetration as well.

Reciprocity of self-disclosure
Disclosure must be returned, not just depth and breadth (Reis and Shaver).

Evaluation

Research support
Positive correlation between satisfaction and self-disclosure (Sprecher and Hendrick), especially when partners take turns (Sprecher *et al.*).

Counterpoint – correlational research does not show disclosures cause satisfaction (could be vice versa, or both caused by time spent together).

Real-world application
57% of homosexual men and women said they use self-disclosure as a maintenance strategy, a skill that can be learned (Haas and Stafford).

Cultural differences
Less sexual self-disclosure in collectivist cultures about sexual thoughts, but experience same satisfaction (Tang *et al.*).

Evaluation extra: Self-disclosure and breakdown
Increased self-disclosure is part of relationship formation but also increases in relationship breakdown (Duck).

Physical attractiveness

Physical good looks increase the liking people have for you.

The theory

Explaining the importance of physical attractiveness
Symmetrical face is attractive because it's an honest sign of genetic fitness, neotenous female faces trigger caring instinct (Shackelford and Larsen). Both naturally selected.

The halo effect
We have positive stereotypes of physically attractive people and assume they possess other positive characteristics (Dion *et al.*).

The matching hypothesis
Computer dance study, no support – chose most physically attractive (Walster *et al.*) but support from Berscheid *et al.* (chose similar level of physical attractiveness).

Evaluation

Research support for the halo effect
Attractive people rated as more politically competent, implications for politics (Palmer and Peterson).

Evolutionary explanation
Some female features (small nose, large eyes) considered attractive across cultures, sexual selection (Cunningham *et al.*).

Research challenging the matching hypothesis
Online dating choices do tend to be for more physically attractive people (Taylor *et al.*).

Counterpoint – dating choices are ideals, meta-analysis of established partners supports matching (Feingold).

Evaluation extra: Individual differences
Evidence shows that physical attractiveness matters (e.g. sexual selection), but non-sexist people are less sensitive to it when judging likeability (Touhey).

Filter theory

Select field of desirables from field of availables.

The theory

Social demography (1st filter)
Demographic factors such as proximity and education level reduce the field of availables (Kerckhoff and Davis).

Similarity in attitudes (2nd filter)
Similarity of attitudes/basic values is attractive in first 18 months (Byrne), promotes self-disclosure.

Complementarity (3rd filter)
Each partner contributing a trait the other lacks (to meet needs) becomes more important than similarity later in a relationship.

Evaluation

Research support
Similarity linked with closeness in early stages, complementarity after 18 months (Kerckhoff and Davis).

Counterpoint – failure to replicate because of social changes and assumption that duration of relationship meant relationship was 'deeper' (Levinger).

Problems with complementarity
Long-term lesbian couples were most satisfied when partners similar – equally dominant (Markey and Markey).

Actual versus perceived similarity
Perceived similarity more important (Montoya *et al.*), couples perceive similarity as they get closer (effect not cause).

Evaluation extra: Social change
1st filter reduces availables, but dating apps have changed the scope of the 1st filter.

Theories of romantic relationships

Social exchange theory

The 'give and take' of romance.

The theory

Rewards, costs and profits
Thibault and Kelley's economic theory, predicting people want a net profit and try to maximise rewards and minimise costs, including opportunity costs (minimax).

Comparison level (CL)
Amount of reward you think you deserve from a relationship compared to the costs, based on past experiences and social norms.

Comparison level for alternatives (CLalt)
We consider whether we could get more rewards and fewer costs elsewhere.

Stages of relationship development
Sampling, bargaining, commitment and institutionalisation stages.

Evaluation

Research support
SET concepts are independent and predictions confirmed in gay and lesbian as well as heterosexual couples (Kurdek).

Counterpoint – SET ignores equity. Perception of fairness more important than amount of rewards and costs.

Direction of cause and effect
Contrary to SET, dissatisfaction may come before consideration of alternatives, not after (Argyle).

Vague concepts
Rewards, costs, comparison levels are subjective and hard to operationalise for testing.

Evaluation extra: Inappropriate central assumptions
SET assumes all relationships are exchange-based (e.g. rewards/costs), but romantic partners probably do not 'keep score' i.e. communal-based (Clark and Mills).

Equity theory

Perceived fairness rather than equal profits.

The theory

The role of equity
Both partners' level of profit needs to be roughly similar, otherwise one overbenefits and the other underbenefits.

Equity and equality
What matters is the ratio of rewards to costs e.g. a high level of costs with a high level of rewards is seen as fair.

Consequences of inequity
Inequity at start of relationship OK, but leads to dissatisfaction. Change behaviour or change perception of inequity.

Evaluation

Research support
Newly-weds report equity is more satisfying than underbenefitting or overbenefitting (Utne *et al.*).

Counterpoint – self-disclosure is a better predictor of satisfaction than equity (Berg and McQuinn).

Cultural limitations
Partners in collectivist societies (Jamaica) more satisfied when overbenefitting, so equity is not universally satisfying (Aumer-Ryan *et al.*).

Individual differences
Benevolents and entitleds are both relatively unconcerned with equity (Huseman *et al.*).

Evaluation extra: Equity – cause or effect?
Inequity leads to dissatisfaction (Utne *et al.*), but 'cycle of misery', monitoring equity leads to more dissatisfaction (Grote and Clark).

Rusbult's investment model

Partners stay because of commitment.

The model

Factor 1: Satisfaction
A satisfying relationship has many rewards and few costs (comparison level, CL).

Factor 2: Comparison with alternatives (CLalt)
Judging other possible partners.

Factor 3: Investment
Resources put into a relationship which would be lost (intrinsic or extrinsic).

Satisfaction versus commitment
Commitment is more important than satisfaction in maintaining relationships, desire to avoid wasting investment.

Relationship maintenance mechanisms
Committed partners act to promote their relationship through accommodation, willingness to sacrifice, forgiveness, etc.

Evaluation

Research support
All three factors of the model predicted relationship commitment.

Counterpoint – many correlations shown, but doesn't mean satisfaction, comparison or investment cause commitment (Le and Agnew).

Explains abusive relationships
Where investment and commitment more important than satisfaction, abused partners stay (Rusbult and Martz).

Oversimplifies investment
Not just current resources but also future plans count, included in extended model (Goodfriend and Agnew).

Evaluation extra: Perception versus reality
Self-report measures are biased but they do tell us a person's perceptions about their reality.

Duck's phase model

How romantic relationships end.

The model

Intra-psychic phase – *'I can't stand this anymore.'*
Dissatisfied partner considers the issues privately, may share with close friends.

Dyadic phase – *'I would be justified in withdrawing.'*
Both partners talk about the relationship, resulting in arguments, negotiations, etc. and also more self-disclosure.

Social phase – *'I mean it.'*
Partners involve their social networks to try and save the relationship and gain support.

Grave dressing phase – *'It's now inevitable.'*
Ex-partners tidy up loose ends by constructing a favourable public and private story. *'Time to get a new life.'*

Evaluation

Real-world application
Model provides strategies to reverse breakdown, useful for partners or counsellors.

Counterpoint – relationships in collectivist cultures different (e.g. family), insights not so applicable.

An incomplete model
5th resurrection phase added, partners may return to earlier phases (Rollie and Duck).

Early phases are less understood
Retrospective recall, especially of early phases (longer ago), lacks accuracy.

Evaluation extra: Description rather than explanation
Duck's model explains what, whereas Felmlee's fatal attraction model explains why.

Virtual relationships in social media

Relationship formation in virtual relationships compared with FtF.

Explanations

Self-disclosure in virtual relationships

Reduced cues theory
Virtual relationships lack FtF cues, so de-individuation, disinhibition and less self-disclosure (Sproull and Kiesler).

The hyperpersonal model
Sender has selective self-presentation (hyperhonest and hyperdishonest), receiver reinforces sender's self-presentation (Walther), anonymity increases self-disclosure (Bargh *et al.*).

Effects of absence of gating in virtual relationships

What is a 'gate'?
A 'gate' = any obstacle to forming a relationship (e.g. shyness, stammer).

Benefits and drawbacks
Allows person to be truer self but permits fake persona to deceive (e.g. changing gender, age, personality).

Evaluation

Lack of support for reduced cues
Virtual relationships still involve cues (e.g. timing, emojis), so emotional states can be expressed (Walther and Tidwell).

Lack of support for hyperpersonal model
Greater self-disclosure FtF than in virtual relationships in self-report studies, or no difference in experimental studies (Ruppel *et al.*).

Counterpoint – conversations in virtual relationships more probing (hyperhonest) than FtF, but also hyperdishonest (Whitty and Joinson).

Support for absence of gating
71% of relationships formed online by shy people still going after two years (McKenna and Bargh), compared to 49% formed offline (Kirkpatrick and Davis).

Evaluation extra: Online versus multimodal
Virtual relationships may be better for self-disclosure, but in reality people use on- and offline communication (Walther).

Parasocial relationships

One-sided relationships with celebrities or other distant figures.

Explanations

Levels of parasocial relationships
From least to most intense: Entertainment-social (e.g. source of gossip), intense-personal (e.g. obsessive thoughts), borderline-pathological (e.g. extreme behaviours) (Maltby *et al.*).

The absorption addiction model
Escape from reality, triggered by stress – a fan absorbs themselves in the celebrity's world, then needs to increase their dose (like addiction to a drug).

Attachment theory explanation of parasocial relationships
Insecure–resistant individuals have unfulfilled emotional needs, parasocial relationships avoid the threat of rejection.

Evaluation

Research support for levels
Link between parasocial intensity and anxiety in intimate relationships (McCutcheon *et al.*).

Support for absorption addiction model
Correlations between level of celebrity worship and poor psychological functioning (e.g. body image/anorexia) (Maltby *et al.*).

Universal tendency
Insecure attachment linked to parasocial relationships across cultures (Dinka *et al.*).

Counterpoint – no link between attachment (in)security and forming parasocial relationships (McCutcheon *et al.*).

Evaluation extra: Causation and correlation
Correlations/natural experiments (e.g. McCutcheon *et al.*) do not demonstrate a cause, but show links and may be only option.

Practice questions, answers and feedback

Question 1 Niamh believes that you have to put a lot into a relationship to get a lot out of it. She says that partners who do this won't 'look elsewhere' and will stay together longer.
Outline how Rusbult's investment model supports Niamh's views about romantic relationships. (*4 marks*)

Morticia's answer *Rusbult believes that lasting relationships depend on investment, anything we would lose if the relationship ended. This includes intrinsic investments like money and self-disclosures as well as extrinsic ones like mutual friends. This is what Niamh means by 'putting a lot in'.* *We 'get a lot out' of the relationship when the rewards outweigh the costs – this means our satisfaction level is high. Partners won't look elsewhere because they make a comparison and conclude that alternatives are less rewarding. Satisfaction is less important than investment but both affect commitment, which is why Niamh says that such couples will stay together longer – commitment is the main psychological factor. Couples stay together even when one is dissatisfied because they have made a big investment.*	Morticia has a clear understanding of the main elements of Rusbult's model. Perhaps she could have linked Niamh's views to the model right at the start of the answer. The answer is well-organised because Morticia addresses each aspect of Niamh's statement. However, not every aspect is linked to the stem.
Luke's answer *Niamh agrees with Rusbult because she thinks that how satisfied you are in a relationship depends on what you put into it.* *Rusbult also says that satisfaction is not as important as investment because this is the thing that has the biggest effect on commitment.* *Comparison with alternatives is also an influence. We look at others around us and work out that having a relationship with them would not be better than what we have already got, so we stick with it. This means the rewards outweigh the costs.*	Luke's first sentence immediately acknowledges the stem but is really just a rephrasing of Niamh's statement – very weak application. The rest of the answer includes some material on Rusbult's model but none of it is linked to the stem.
Vladimir's answer *Our relationships depend on many things which include comparison, rewards, investments and satisfaction. We compare with other relationships and this will affect whether we stay or go. When the costs outweigh the rewards, this also means that we will end the relationship. Investments are important too. If we make big investments then we decide we don't want to lose them so we stay. But investments are less important than commitment and this depends on how satisfied you are. Partners who are satisfied will stay together longer because they are happy and don't see any alternatives. So this means that Niamh's views are very similar to the model by Rusbult.*	Vladimir's answer is confused, containing some relevant ideas but these are poorly expressed and not appropriately applied. There is attempted application within the final sentence but this is rather weak.

Question 2 Outline the equity theory of romantic relationships. (*4 marks*)

Morticia's answer *Equity theory is an economic explanation for how relationships form and are maintained. It is called 'economic' because it suggests that the key to a relationship is fair trading. Equity theory was developed out of social exchange theory and, in contrast, suggests that relationships are not just about profits and losses but about each partner thinking the inputs and outputs are fair.* *One problem with this theory is that it may only apply to individualist cultures who are more concerned with what each person gets whereas collectivist societies are more focused on the needs of others and actually may prefer relationships where their partner overbenefits (Aumer-Ryan et al.).*	Morticia's outline of equity theory is accurate and reasonably detailed. The comparison with social exchange theory is useful as a way of demonstrating understanding of equity theory. The second part of the answer is irrelevant as the command term was 'outline'. Time would have been better spent providing an example of equity to convey understanding.
Luke's answer *Equity theory, proposed by Walster et al., is concerned with fairness. A partner who is overbenefitting would feel uncomfortable. What is important is the ratio of rewards and costs rather than their size. A lack of equity leads a partner to feel distressed and dissatisfied, the greater the perceived inequity the greater the dissatisfaction. In the early days of a relationship inequity may matter less but, as the relationship progresses the partners in a successful relationship will work at maintaining equity. Actually what may be adjusted is the perception of the rewards and costs rather than the rewards and costs themselves so nothing may change, it's just that partners adjust their perceptions.*	Luke has focused on a slightly different aspect of the theory than Morticia and demonstrated a thorough understanding.
Vladimir's answer *Equity theory is about equality in a relationship. Partners like to feel a sense of balance in what they have, in the same way a business feels about their partners. It should be fair so that no one is getting more than the other. Partners consider their losses and gains and weigh these up in order to decide whether the relationship is worth pursuing. People dislike being overbenefitted as well as being underbenefitted though this may vary with individual differences – in other words some people prefer one or the other.*	Vladimir's answer is less well articulated than Luke's and the first sentence is wrong (the description sounds more like he's describing SET). Some key aspects of equity theory are explained, providing a somewhat limited response which is not always accurate.

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

Question 3 Describe **and** evaluate Duck's phase model of relationship breakdown. (*16 marks*)

Luke's answer *Duck's phase model has four phases. In the first phase, which is the intra-psychic phase, the dissatisfied partner considers the dissatisfactions privately and possibly with close friends.*

In the second phase, the dyadic phase, both partners start talking about the relationship, resulting in arguments, negotiations, recriminations, etc.

In the social phase, partners involve their social networks in an attempt to save the relationship and also gain support.

And finally in the grave dressing phase the now ex-partners tidy up the loose ends of the relationship by constructing a favourable public and private story.

At any point the partners may exit and repair the relationship but each phase has a tipping point where things have gone too far and then it is time for the next phase.

Luke's outline of the phase model is concise but accurate and sufficient for the descriptive content within this question.

Duck himself criticised this phase model saying that it was incomplete. He added a fifth phase, the resurrection phase, where partners start thinking ahead to new relationships. In the new model Duck also said that people may return to earlier phases – it's not a simple linear progression. The earlier model lacked the dynamic nature of the newer one.

This paragraph ('Duck himself criticised …') could be read equally as further description or evaluative commentary but, either way, is relevant and well-phrased.

A good theory should have research support and one of the issues with this theory is that the research is inevitably retrospective – you find couples who have broken up and then ask them to recall what happened. It may be that they don't remember things exactly. In fact their later experiences may affect the way they remember the early phases.

A good theory should also have real-world relevance and this theory offers assistance to relationship counsellors who can see what phase a couple is in and recognise strategies that may help at this time to avoid the tipping point. Duck suggests, for example, that people in the intra-psychic phase could focus on the positive aspects of their partner.

The remaining paragraphs all contain good, clear, well-elaborated criticisms of the theory. They all illustrate the skill of sustained commentary.

An important criticism is that this theory really is more of a description than an explanation of why breakdown happens. For example, Felmlee's fatal attraction theory explains that the reason relationships break down is the thing you found initially attractive becomes very annoying. Such as having a partner who is very outgoing, which you admire initially but then come to dislike. Duck's theory just describes the process of that breakdown and therefore doesn't offer insights into breakdown.

Like many theories, this theory has an individualist bias, describing relationships from the standpoint of one kind of culture. Relationships in collectivist cultures may be more difficult to end because other people (e.g. family) are closely involved, and perhaps romantic issues are less of a priority. This means the theory has a limited application. **(433 words)**

The most striking thing about this response is that Luke has managed to maintain the appropriate balance between descriptive and evaluative elements for an A-level essay.

Vladimir's answer *In this essay I am going to describe and evaluate one of the most important theories of relationship breakdown, Duck's phase model of romantic breakdown – so this shows it is just about the breakdown of romantic relationships though of course there are other relationships too that break down, but romantic ones are quite different. Duck described this breakdown in terms of four stages or phases because he could see that there are particular steps in the process, it doesn't all happen at once. The theory was based on research with couples who experienced relationship breakdown and Duck identified thresholds that occur when one partner is dissatisfied. The first threshold is right at the beginning when one partner is distressed about the relationship and feels they can't stand it any more. This starts the intra-psychic phase of thinking about what's wrong in the relationship. The person may discuss their feelings with someone else. The person finally feels they are right to end the relationship. Many people stay in this phase for a very long time. The next phase is the dyadic phase when the two partners start talking to each other. The partners may decide to make things better or decide that it is time to end. This leads into the social phase where they involve other people in the break-up discussions such as close family and friends. People are likely to take sides and this makes it hard to turn back. Nasty secrets may be revealed. It's really inevitable that the break up will occur. The final phase is grave dressing where both partners work out their 'story' – their account of what really happened. Such a story is important for future relationships because each partner wants to look 'good'.*

An awkward beginning from Vladimir which tends not to go anywhere initially. A clear outline of the theory – a la Luke – would have been preferable.

When Vladimir does begin to tackle the main features of the model, some of the points are a little laboured and there is a lack of conciseness, which will affect the overall balance of the essay.

Duck's account is culturally biased as it is based in individualist cultures like America and the UK and doesn't relate well to collectivist societies. So we can't generalise it to all people all over the world. It really is for just one group of people. It's also quite determinist because it suggests that this is what will happen to you if your relationship starts to go wrong. It could also be described as reductionist because it reduces a complex relationship to some very simple elements. A more holistic approach might look at the whole relationship and that might be better.

The cultural point is not well made – why does the theory prioritise individualist experience? Determinism and reductionism are 'thrown in' as issues but not really made relevant.

Duck later worked with another psychologist to think about a better way to describe the process. They revised the original theory by adding another phase at the end which applied to future relationships, and trying to avoid making the same mistakes again. They also suggested that maybe the original model was too rigid and there was room for some more flexibility. Overall though, the model has been very well used and people think it is useful. **(465 words)**

In the final paragraph a couple of other points are made but not clearly elaborated.

Overall, Vladimir has focused too much on description rather than evaluation which the question requires in larger measure.

Multiple-choice questions

Evolutionary explanations for partner preferences

1. Anisogamy refers to:
   (a) Female choosiness in mate selection.
   (b) Difference between inter-sexual selection and intra-sexual selection.
   (c) Indicators of a body shape suggesting fertility.
   (d) Differences between male and female gametes.

2. An example of inter-sexual selection is:
   (a) Male competition for reproductive rights.
   (b) Female choosiness.
   (c) Male protection of fertile females.
   (d) Sensitivity to indicators of fertility and youth.

3. Dimorphism is mostly the outcome of:
   (a) Intra-sexual selection.
   (b) Inter-sexual selection.
   (c) The female's greater investment in offspring.
   (d) Female competition for fit males.

4. Buss found that _____ seek resource-related characteristics.
   (a) Both men and women equally.
   (b) Women more than men.
   (c) Only men.
   (d) Men more than women.

Factors affecting attraction in romantic relationships: Self-disclosure

1. Self-disclosure is a central concept of which theory?
   (a) Intimacy theory.
   (b) Reciprocity theory.
   (c) Social penetration theory.
   (d) Commitment theory.

2. At the start of a relationship, couples tend to reveal:
   (a) Very little information.
   (b) A lot of in-depth information quickly.
   (c) A lot of superficial information.
   (d) Secrets.

3. A feature of self-disclosure in satisfying relationships is:
   (a) It is used rarely.
   (b) It is reciprocated.
   (c) It is needed less and less over time.
   (d) It just comes naturally and does not need to be used deliberately.

4. What metaphor do Altman and Taylor use to explain self-disclosure?
   (a) Peeling an orange.
   (b) Coring an apple.
   (c) Digging a tunnel.
   (d) Layers of an onion.

Factors affecting attraction in romantic relationships: Physical attractiveness

1. 'People who are physically attractive are assumed to have other attractive traits' is a description of the:
   (a) Matching hypothesis.
   (b) Social desirability effect.
   (c) Halo effect.
   (d) Effects of facial symmetry.

2. A feature of faces we seem to find especially attractive is:
   (a) Symmetry.
   (b) Signs of ageing.
   (c) Averageness.
   (d) Individuality.

3. The matching hypothesis suggests that:
   (a) We all prefer the most physically attractive person available.
   (b) Physical attractiveness plays only a small role in relationship formation.
   (c) The halo effect is unimportant.
   (d) We take account of our own level of physical attractiveness when selecting a partner.

4. Taylor *et al.*'s study of online dating measured:
   (a) Fantasy preferences.
   (b) Actual partner choices.
   (c) The halo effect.
   (d) Facial symmetry.

Factors affecting attraction in romantic relationships: Filter theory

1. An example of a social demography filter is:
   (a) Attitude similarity.
   (b) Complementarity.
   (c) Ethnic group.
   (d) Physical attractiveness.

2. Filters narrow our choice of partner:
   (a) From a field of desirables to a field of availables.
   (b) To people who are different from us.
   (c) To people who are more physically attractive than us.
   (d) From a field of availables to a field of desirables.

3. Complementarity of partners is most important:
   (a) At the start of a relationship.
   (b) Before the relationship begins.
   (c) Later on in a relationship.
   (d) Throughout a relationship.

4. Partners becoming more similar to each other over time is illustrated by:
   (a) Reciprocity.
   (b) Attitude alignment.
   (c) Complementarity.
   (d) Social demography.

Theories of romantic relationships: Social exchange theory

1. According to SET, an individual will find a relationship satisfying when:
   (a) Their partner's profit is greater than their own.
   (b) Their comparison level is high.
   (c) Their self-esteem is high.
   (d) There is fairness.

2. The comparison level for alternatives states:
   (a) We consider the costs and rewards we could get elsewhere.
   (b) Similarity is an important feature of successful relationships.
   (c) Any relationship is better than being on our own.
   (d) Alternatives become more attractive the longer partners are together.

3. The correct order of Thibault and Kelley's stages of relationship development is:
   (a) Bargaining, Sampling, Commitment, Institutionalisation.
   (b) Sampling, Bargaining, Commitment, Institutionalisation.
   (c) Sampling, Commitment, Bargaining, Institutionalisation.
   (d) Commitment, Sampling, Bargaining, Institutionalisation.

4. Clark and Mills (2011) argue that romantic relationships:
   (a) Are exchange-based.
   (b) Are based on economics.
   (c) Involve 'keeping score'.
   (d) Are communal-based.

Theories of romantic relationships: Equity theory

1. Equity is:
   (a) An equal distribution of costs and rewards between each partner.
   (b) A disparity between partners.
   (c) A similar ratio of costs and rewards for each partner.
   (d) Rewards minus costs.

2. Overbenefitted partners:
   (a) May experience some guilt and shame because of inequity.
   (b) May be angry and resentful at their poor treatment.
   (c) Are likely to be dissatisfied with the relationship.
   (d) Always work hard to increase equity.

3. A cognitive consequence of inequity is:
   (a) We might end the relationship.
   (b) We will act to make the relationship fair.
   (c) We might adjust our expectations of the relationship.
   (d) Feeling depressed because of unfairness.

4. Benevolents are people who:
   (a) Overbenefit from a relationship.
   (b) Contribute more than they get.
   (c) Think they deserve more rewards than they get.
   (d) Work hard to make the relationship equitable.

Theories of romantic relationships: Rusbult's investment model

1. A committed relationship is one in which:
   (a) There is little satisfaction.
   (b) Each partner's costs are about the same as their rewards.
   (c) Alternatives are attractive.
   (d) Both partners have made an investment they don't want to see go to waste.

2. Rusbult defines an investment as:
   (a) Anything the partners stand to lose if the relationship ends.
   (b) Something you have to be able to put a price on.
   (c) A fair balance of rewards and costs.
   (d) A cause of satisfaction.

3. According to the investment model, the main psychological factor in romantic relationships is:
   (a) Satisfaction.
   (b) Reciprocity.
   (c) Commitment.
   (d) Profit.

4. An important strength of the investment model is:
   (a) It is supported by correlational research.
   (b) Its understanding of investment.
   (c) It can explain relationships involving intimate partner violence.
   (d) It views satisfaction as necessary for commitment.

Theories of romantic relationships: Duck's phase model

1. Creating a 'story' of the relationship is most associated with the:
   (a) Social phase.
   (b) Intra-psychic phase.
   (c) Grave dressing phase.
   (d) Dyadic phase.

2. The model was extended to include:
   (a) The resurrection phase.
   (b) Simpler links between each phase.
   (c) Cultural differences.
   (d) Breakdown thresholds.

3. The correct order of the model's phases is:
   (a) Dyadic, Social, Intra-psychic, Grave dressing.
   (b) Social, Intra-psychic, Dyadic, Grave dressing.
   (c) Intra-psychic, Dyadic, Social, Grave dressing.
   (d) Intra-psychic, Social, Dyadic, Grave dressing.

4. A useful application of the model is that it:
   (a) Can explain relationship breakdown in most cultures.
   (b) Identifies when and how relationships can be repaired.
   (c) Is based on research into the very earliest steps in relationship breakdown.
   (d) Shows that one phase inevitably leads to another.

Virtual relationships in social media

1. According to reduced cues theory, in virtual relationships:
   (a) Tone of voice is unimportant.
   (b) De-individuation is a feature.
   (c) There is a high level of self-disclosure.
   (d) Emoticons are good substitutes for facial expressions.

2. Selective self-presentation is associated with the:
   (a) Hyperpersonal model.
   (b) Reduced cues theory.
   (c) Absence of gating.
   (d) De-individuation.

3. An ungated virtual relationship is one in which:
   (a) Your appearance really matters.
   (b) Self-disclosure is poor.
   (c) Shy people are at a disadvantage.
   (d) You can manipulate your identity.

4. McKenna and Bargh (2000) found that _____ of virtual relationships survived at least _____ years.
   (a) 71%, two.
   (b) 71%, five.
   (c) 49%, two.
   (d) 49%, five.

Parasocial relationships

1. Contemplating doing something illegal to impress a celebrity is a feature of which level of parasocial relationship?
   (a) Borderline-pathological.
   (b) Intense-personal.
   (c) Entertainment-social.
   (d) All of these levels.

2. Having a weak sense of identity is a feature of:
   (a) Attachment theory.
   (b) All parasocial relationships.
   (c) The absorption addiction model
   (d) The entertainment-social level.

3. According to attachment theory, parasocial relationships are more likely to be formed by people who are:
   (a) Insecure–avoidant.
   (b) Insecure–resistant.
   (c) Securely attached.
   (d) Borderline-pathological.

4. A serious limitation of much research in this field is:
   (a) It's mostly correlational.
   (b) It lacks ecological validity.
   (c) It hasn't tested predictions derived from the main theories.
   (d) It doesn't explain cultural differences.

MCQ answers
Evolutionary explanations for partner preferences 1D, 2B, 3A, 4B
Factors affecting attraction in romantic relationships: Self-disclosure 1C, 2C, 3B, 4D
Factors affecting attraction in romantic relationships: Physical attractiveness 1C, 2A, 3D, 4B
Factors affecting attraction in romantic relationships: Filter theory 1C, 2D, 3C, 4B
Theories of romantic relationships: Social exchange theory 1B, 2A, 3B, 4D
Theories of romantic relationships: Equity theory 1C, 2A, 3C, 4B
Theories of romantic relationships: Rusbult's investment model 1D, 2A, 3C, 4C
Theories of romantic relationships: Duck's phase model 1C, 2A, 3C, 4B
Virtual relationships in social media 1B, 2A, 3D, 4A
Parasocial relationships 1A, 2C, 3B, 4A

Chapter 6 Gender



This chapter is concerned with how each of us develops our gender identity.

Psychology incorporates both biological and social explanations. So, if we begin with biology, humans are like all animals – their sex (being male or female) is determined by their chromosomes (as explained on page 148). Chromosomes influence the production of hormones. There is evidence that these biological factors can have a profound effect on whether a person feels like they are a man or a woman (their gender identity), as in the case of the Batistas (page 148) and David Reimer (page 153).

However, humans are different from animals. The main difference is language. Humans can communicate in a way no other animal can and this leads us to be able to socially construct our identities. Our identity is very much a personal and social construction.

Nevertheless, in this chapter we have to represent both biological and social explanations. Both are part of the puzzle in trying to understand how gender identity emerges in each individual. Our understanding of gender and the traditional theories named in the specification (and our explanation of them) needs to be read with that in mind.



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Sex and gender

The specification says...

Sex and gender. Sex-role stereotypes.

Sex and gender are different things. This spread explains the distinction between the two concepts and how our social and cultural understanding of what it means to be a man or a woman gives rise to sex-role stereotypes.

Key terms

Sex The biological differences between males and females including chromosomes, hormones and anatomy.

Gender The psychological, social and cultural differences between boys/men and girls/women including attitudes, behaviours and social roles.

Sex-role stereotype A set of beliefs and preconceived ideas about what is expected or appropriate for men and women in a given society or social group.



Practical activity on pages 168 and 169

Key concepts

SEX

OK, now we've got your attention, let's begin…

In everyday life, the terms **sex** and **gender** are often used interchangeably suggesting they are one and the same. Job application forms, for instance, may equally ask someone to specify their 'sex' or their 'gender' when trying to establish whether the applicant is a man or a woman. Most psychologists, however, recognise sex and gender as distinct and separate concepts.

Sex refers to a person's biological status as either male or female. This is determined by one pair of sex **chromosomes** (XX for females and XY for males). These chromosomes then influence **hormonal** differences as well as differences in anatomy, such as reproductive organs, body shape, hair growth, etc.

Gender

In contrast, gender refers to a person's psychosocial status as either masculine or feminine. This includes all the attitudes, roles and behaviours that we associate with 'being a man' or 'being a woman' and these are heavily influenced by social norms and cultural expectations. To put it another way, sex is **innate** and the result of **nature** whilst gender is at least partly environmentally determined and therefore due to **nurture**.

Therefore the argument is that because an individual's sex is innate (i.e. **genetic**, hormonal) and not 'assigned' at birth, it cannot be changed. However, gender is 'assigned' because it is a social construct rather than a biological fact. Because gender is at least partly determined by nurture, it is not 'fixed' but rather is fluid and open to change. A person may become 'more masculine' or 'more feminine' depending on the social context they are in, and the norms and expectations associated with it.

Gender dysphoria

For most people, their biological sex and gender identity correspond. In other words, the majority of biological males tend to 'feel' masculine and readily identify themselves as such, whilst most biological females would likewise perceive themselves as feminine. Some people, however, experience **gender dysphoria** (discussed on page 166) when their biologically prescribed sex does not reflect the way they feel inside and the gender they identify themselves as being. Some who experience this may choose to have gender reassignment surgery in order to bring their sexual identity in line with their gender identity.

Apply it
Concepts

Is it as simple as male or female?

Some children are exposed (not purposely) to hormonal imbalances in the womb which mean that their genitals appear neither obviously male nor female at birth. Such children are known as 'intersex' and their parents are often encouraged to opt for surgery to make the child's sex clear so they can be classified as male or female.

In 2013, Germany became the first European country to introduce a third gender category ('X') on birth certificates to prevent parents having to make choices about their child's sex before the child itself can decide.

Questions

1. What are the potential issues and benefits of a third gender category?
2. Do you think this is something that should be introduced in this country? Explain your answer.

Apply it
Concepts

Can a person change their gender?

Julianne Imperato-McGinley *et al.* (1974) studied the Batista family who lived in the Dominican Republic. Four of the children within the family were identified as female at birth and raised as such until puberty, when they 'changed' into males – each of the children's vaginas closed over, testicles appeared and they grew normal-sized penises.

The four girls (now boys) were all affected by a very rare genetic disorder, which meant their male genitalia were not external at birth but were concealed inside (genetically they had XY sex chromosomes). During prenatal development, a crucial chemical step (the introduction of the hormone *dihydrotestosterone*) was missed, which would normally externalise the male genitalia. As such, although their biological sex was male (unbeknown to their family), they had the external appearance of females at birth. Because of this they were raised as girls and adopted a female gender identity.

Due to the onset of hormonal changes at puberty, the hormone (*dihydrotestosterone*) that was absent in the womb was produced and the boys' biological sex was revealed.

The interesting thing that the researchers found was that, in each case, the boys abandoned their female gender identity with very few problems of adjustment, and quickly adapted to their new roles as boys and men – suggesting that gender identity may be flexible rather than fixed.

Question

Although this study would appear to support the idea that gender identity can change, critics have suggested that these findings should be interpreted with caution. The Dominican Republic was a highly patriarchal society when the children grew up. Men and boys were valued over women and girls to the extent that the Batista boys were described at puberty as 'little miracles' by members of the local community. How might this have helped them adjust to their newly-acquired gender role?

Sex-role stereotypes

Consider a stereotypical heterosexual couple – who takes out the bins, puts up shelves and fixes the car? Who usually remembers birthdays, sends cards, prepares food and gets the kids ready for school?

There is no obvious biological reason why these tasks should exclusively apply to either gender. But traditionally, many people would consider the first set of tasks as appropriate for the man in the relationship and the second set as appropriate for the woman.

Sex-role stereotypes are a set of shared expectations that people within a society or culture hold about what is acceptable or usual behaviour for men and women. These expectations are somehow communicated or transmitted throughout society and may be **reinforced** by parents, peers, the media, as well as other institutions such as schools. Although some sex-role stereotypes may contain a 'grain of truth' (see right), many do not, and may lead to sexist assumptions being formed, such as the idea that a woman will not have the capacity to cope with a position of high responsibility in the workplace, as she may become 'over-emotional'.

There are a number of studies of sex-role stereotyping within this chapter (see, for example, Smith and Lloyd on page 163 and Furnham and Farragher on page 164). These studies can be used to support the **social learning theory** of gender (see page 162) view that various *agents of socialisation*, such as parents or the media, sustain the stereotypical expectations we have of men and women in society.

Apply it Concepts — Popular stereotpyes

Question

Which of the following sex-role stereotypes traditionally apply to men and which to women in our society?

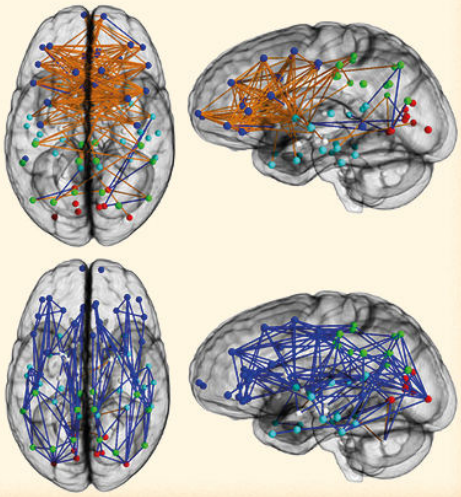
- *Settle arguments with their fists*
- *Settle arguments with the 'silent treatment'*
- *The child carer in a family*
- *The breadwinner in a family*
- *Poor drivers*
- *Spend hours getting ready in the morning*
- *Commitment phobic*
- *Cries at a sad film*
- *Leaves the toilet seat up*
- *Obsessed with sex*
- *Loves shopping*
- *Hates shopping*

Although some of the more popular sex-role stereotypes above may have little or no basis in fact, others do. The widely-held belief that women are better at multitasking than men has been supported in a recent study of the differences in neurological (brain) activity between men and women.

Madhura Ingalhalikar *et al.* (2014) scanned the brains of 949 young men and women in the biggest investigation of its kind to date. Using hi-tech diffusion MRI imaging, they mapped the connections between the different parts of the brain.

The researchers discovered that women's brains (top pictures) have far better connections between the left and right sides of the brain, while men's brains (bottom pictures) display more intense activity within the brain's individual parts, especially the cerebellum which controls motor skills.

The conclusion from this is that a woman's brain is hardwired to cope better with several tasks at once whereas a man's brain prefers to focus on a single complex task.



Apply it Concepts — We raised our baby gender-neutral

When Beck Laxton and Kieran Cooper had their first baby they decided they would not tell anyone the baby's gender. They referred to their child as 'the Infant' and gave the child only gender-neutral toys to play with. They used clothes that most people would label as appropriate for boys and girls (like yellow trousers). Therefore no-one could use clothing as a cue to the child's gender.

Beck wanted to avoid gender stereotyping because she thought it was 'fundamentally stupid' to 'shape the kind of person you become' based on what you wear and play with. Soon after the child started primary school in 2012, Beck and Kieran finally revealed their child's gender to the world.

Questions

1. What might be the benefits and potential issues of raising a child as gender-neutral?
2. To what extent do you agree with the idea that a child's gender can 'shape the kind of person you become'?

Source: *The Daily Telegraph* (2012)

Apply it Concepts — Playing football

David was playing football in the garden when his sister Judith began to join in. 'When I grow up I want to be a footballer,' said Judith. 'Don't be silly,' David replied, 'girls can't play football.'

Question

Define the term 'sex-role stereotype'. Refer to David and Judith's conversation in your answer.

Check it

1. Explain what is meant by 'sex-role stereotypes'. *[3 marks]*
2. Explain the difference between sex and gender. *[4 marks]*
3. Explain what is meant by 'sex' and 'gender'. Refer to psychological research in your answer. *[4 marks]*
4. Outline what psychological research has shown about sex-role stereotypes. *[4 marks]*

Androgyny

The specification says...

Androgyny and measuring androgyny including the Bem Sex Role Inventory.

Many researchers have suggested that, in recent decades, there has been a blurring of the distinction between masculinity and femininity. It is claimed that young people in particular are becoming increasingly androgynous in their behaviour and attitudes.

In this spread, we explore the concept of androgyny as well as Sandra Bem's attempt to measure it.

Key terms

Androgyny Displaying a balance of masculine and feminine characteristics in one's personality.

Bem Sex Role Inventory The first systematic attempt to measure androgyny using a rating scale of 60 traits (20 masculine, 20 feminine and 20 neutral) to produce scores across two dimensions: masculinity-femininity and androgynous-undifferentiated.



If David Beckham filled in the BSRI would he tick more feminine than masculine characteristics – loves children, sensitive to the needs of others ...

Apply it
Methods

Androgyny and parental influence

Psychologists were interested to know whether children who were raised by same-gender parents were more likely to be androgynous than children raised by mixed-gender parents. A total of 40 children (20 raised by same-gender parents and 20 raised by mixed-gender parents) completed the BSRI and it was found that there was no significant difference in androgyny scores between the two groups.

Questions

1. What is the **IV** and the **DV** in the investigation above? (*2 marks*)
2. What type of **experiment** is the investigation above? Explain your answer. (*3 marks*)
3. Which **statistical test** should the psychologists have used to compare the androgyny scores between the two groups? Justify your answer. (*3 marks*)

Androgyny

Defining androgyny

The term **androgyny**, like the terms **sex** and **gender**, is useful in illustrating the difference between common-sense understanding and the way a concept is used in psychological research. In everyday language, to be 'androgynous' is to have the appearance of someone who cannot be clearly identified as a man or a woman, and this 'look' is often seen as an asset in the fashion or music industry, for example.

Within psychology, androgyny refers to a personality type that is characterised by a mixture – or, more accurately, a *balance* – of masculine and feminine traits, attitudes and behaviours. This could include a man or woman who is competitive and aggressive at work, but a caring and sensitive parent. Sandra Bem developed a method for measuring androgyny (see below) and suggested that high androgyny is associated with psychological well-being. This is because individuals who are (psychologically) both masculine and feminine in roughly equal measure are better equipped to adapt to a range of situations, whereas non-androgynous people would find this difficult because they have a narrower range of traits to draw on.

As suggested, it is important to recognise that both men and women can be androgynous. However, it is worth noting that an over-representation of opposite-gender characteristics does not qualify as androgyny – a woman who is very masculine or a man who is very feminine would not exhibit the necessary balance of masculine and feminine traits.

Measuring androgyny: The Bem Sex Role Inventory (BSRI)

Sandra Bem's (1974) scale presents 20 characteristics that would be commonly identified as 'masculine' (such as competitive and aggressive), and 20 that would be typically judged as 'feminine' (including tender and gentle). A further 20 'neutral' traits are also included in the scale.

Respondents are required to rate themselves on a seven-point **rating scale** for each item (where 1 is 'never true of me' and 7 is 'always true of me'). Scores are then classified on the basis of two dimensions (masculinity–femininity and androgynous–undifferentiated) as follows:

Score	Classification
High masculine, low feminine	Masculine
High feminine, low masculine	Feminine
High masculine, high feminine	Androgynous
Low feminine, low masculine	Undifferentiated

Items on the BRSI.

Masculine items		Feminine items		Neutral items	
49.	Acts as leader	11.	Affectionate	51.	Adaptable
46.	Aggressive	5.	Cheerful	36.	Conceited
58.	Ambitious	50.	Childlike	9.	Concientious
22.	Analytical	32.	Compassionate	60.	Conventional
13.	Assertive	53.	Does not use harsh language	45.	Friendly
10.	Athletic	35.	Eager to soothe hurt feelings	15.	Happy
55.	Competitive	20.	Feminine	3.	Helpful
4.	Defends own beliefs	14.	Flatterable	48.	Inefficient
37.	Dominant	59.	Gentle	24.	Jealous
19.	Forceful	47.	Gullible	39.	Likeable
25.	Has leadership abilities	56.	Loves children	6.	Moody
7.	Independent	17.	Loyal	21.	Reliable
52.	Individualistic	26.	Sensitive to the needs of others	30.	Secretive
31.	Makes decisions easily	8.	Shy	33.	Sincere
40.	Masculine	38.	Softly spoken	42.	Solemn
1.	Self-reliant	23.	Sympathetic	57.	Tactful
34.	Self-sufficient	44.	Tender	12.	Theatrical
16.	Strong personality	29.	Understanding	27.	Truthful
43.	Willing to take a stand	41.	Warm	18.	Unpredictable
28.	Willing to take risks	2.	Yielding	54.	Unsystematic

The number preceding each item relects the position of each adjective as it actually appears on the inventory.

Evaluation

Quantitative approach

One strength of Bem's work is that androgyny is measured **quantitatively**.

Bem's numerical approach is useful for research purposes when it is necessary, for example, to quantify a **dependent variable** in a research study. However Janet Spence (1984) argues that there is more to gender than a set of behaviours typical of one gender or the other, so **qualitative** methods offer a better way of analysing gender. One compromise is to combine different scales. For example, the *Personal attribute questionnaire* (PAQ) adds another dimension (instrumentality and expressivity) to Bem's masculinity–femininity dimension.

This suggests that both quantitative together with qualitative approaches may be useful for studying different aspects of androgyny.

Valid and reliable

Another strength of the BSRI is, at the time it was developed, it appeared to be a **valid** and **reliable** way of measuring androgyny.

The scale was developed by asking 50 male and 50 female judges to rate 200 traits in terms of how much the traits represented 'maleness' and 'femaleness'. The traits that scored highest in each category became the 20 masculine and 20 feminine traits on the scale. The BSRI was then piloted with over 1000 students and the results broadly corresponded with the participants' own description of their gender identity, demonstrating validity. A follow-up study involving a smaller sample of the same students produced similar scores when the students were tested a month later, demonstrating **test-retest reliability.**

This gives us reason to believe the test was both valid and reliable.

Counterpoint The BSRI was developed over 40 years ago and behaviours that are regarded as 'typical' and 'acceptable' in relation to gender have changed significantly since then. Bem's scale is made up of stereotypical ideas of masculinity and femininity that may be outdated. In addition, the scale was devised using people all from the United States. Notions of maleness and femaleness in this country may not be shared across all cultures and societies.

This suggests that the BSRI may lack **temporal validity** and **generalisability**, and not be a suitable measure of gender identity today.

Self-awareness

One limitation of the BSRI is that people may not have insight into their degree of masculinity, femininity or androgyny.

Asking people to rate themselves on a questionnaire relies on people having an understanding of their personality and behaviour that they may not necessarily have. Gender is a social construct which may be more open to interpretation than, say, sex (which is a biological fact). Furthermore, the questionnaire's scoring system is subjective and people's application of the 7-point scale may differ.

This suggests that the BSRI may not be an objective, scientific way of assessing masculinity, femininity or androgyny.

Evaluation eXtra

Androgyny and well-being

Within her research, Bem placed great emphasis on the idea that androgynous individuals are more psychologically healthy as they are best placed to deal with situations that demand a masculine, feminine or androgynous response.

This assumption has since been challenged. Some researchers have argued that people who develop a greater proportion of masculine traits are better adjusted as these are more highly valued in individualist cultures (Adams and Sherer 1985).

Consider: *Is a mixture of traits (androgyny) psychologically healthier than masculinity alone?*



The 'ladette' – the subject of many an outraged tabloid front page in the 1990s.

Apply it
Concepts

Metrosexuals and ladettes – the changing face of masculinity and femininity in Western society

One criticism of the BSRI (see facing page) is that it relies on stereotypical and outdated notions of masculinity and femininity. The argument put forward by many commentators is that the traditional dividing line between what is considered typical male and female behaviour has become increasingly blurred in recent years. This can be illustrated by two terms, both of which became new entries into the Oxford English Dictionary in the 1990s – the *metrosexual* and the *ladette*.

Metrosexual is derived from *metropolitan* and *heterosexual* and is a word first coined in 1994. It refers to a man who is especially preoccupied with his grooming and appearance, typically spending a significant amount of time and money on shopping as part of this (which would be traditionally recognised as a feminine pursuit).

Meanwhile the mid-90s also saw the birth of the *ladette* as more and more young women embraced lager-drinking culture, football and being loud and offensive (traditionally the exclusive domain of males). The increasingly ubiquitous ladette – 'a woman who behaves in a boisterously assertive or crude manner and engages in heavy drinking sessions' (Oxford English Dictionary) – gave rise to a number of outraged tabloid headlines and even a TV show (*Ladette to Lady*) that aimed to transform the new caricature into its more feminine counterpart.

Question

Explain why ladettes and metrosexuals would not be classified as androgynous using Bem's criteria.

Check it

1. Using an example, define 'androgyny'. *[3 marks]*
2. Outline **one** way of measuring androgyny. *[4 marks]*
3. Explain **two** criticisms of the Bem Sex Role Inventory. *[6 marks]*
4. Discuss the Bem Sex Role Inventory. *[16 marks]*

The role of chromosomes and hormones

The specification says...

The role of chromosomes and hormones (testosterone, oestrogen and oxytocin) in sex and gender.

Earlier in this chapter we stated that sex and gender are distinct concepts. However, from a purely biological perspective, sex and gender are one and the same. Behavioural, psychological and social differences between the sexes are seen to be the result of anatomical, chromosomal and hormonal differences within the body.

From this perspective, 'anatomy is destiny' in the sense that our biological sex *determines* our gender and development. In this spread, we examine the extent to which this claim is true.

Key terms

Chromosomes Found in the nucleus of living cells and carrying information in the form of genes. The 23rd pair of chromosomes determines biological sex.

Hormone A biochemical substance that circulates in the blood but only affects target organs. They are produced in large quantities but disappear quickly. Their effects are very powerful.

Testosterone A hormone from the androgen group that is produced mainly in the male testes (and in smaller amounts in the female ovaries). Associated with aggressiveness.

Oestrogen The primary female hormone, playing an important role in the menstrual cycle and reproductive system.

Oxytocin A hormone which causes contraction of the uterus during labour and stimulates lactation.



The hormone oxytocin is thought to reduce stress and promote feelings of love and intimacy between couples.

The role of chromosomes and hormones in sex and gender

The role of chromosomes

Chromosomes are made from **DNA**. **Genes** are short sections of DNA that determine the characteristics of a living thing. There are 46 chromosomes in the human body arranged into 23 pairs – with the last of these, the 23rd pair, determining biological sex. The chromosomal structure for females is XX, and for males XY – so named because this is how they appear when viewed under a microscope.

All normal egg cells produced by a human ovary have an X chromosome. Sperm carry an X or Y chromosome. The baby's sex is determined by the sperm that fertilises the egg cell. The baby will be female if the fertilising sperm carries an X chromosome, or male if the sperm carries a Y chromosome. The Y chromosome carries a gene called the 'sex-determining region Y', or SRY for short. The SRY gene causes testes to develop in an XY embryo. These produce **androgens**: male sex hormones. (Not all babies follow the same basic pattern, however, which is discussed on the next spread.)

The role of hormones

Chromosomes initially determine a person's sex but most gender development actually comes about through the influence of hormones. Prenatally in the womb, hormones act upon brain development and cause development of the reproductive organs. At puberty, during adolescence, a burst of hormonal activity triggers the development of secondary sexual characteristics such as pubic hair. Males and females produce many of the same hormones but in different concentrations. Of primary importance in male development are a number of hormones called **androgens**, the most widely known of which is testosterone.

Testosterone

Testosterone is a male hormone, though it is present in small quantities in women. It controls the development of male sex organs during foetal development – if a genetic male produces no testosterone during foetal development, then no male sex organs appear. If a genetic female produces high levels of testosterone during this time, then male sex organs may appear.

According to the evolutionary explanation, high levels of testosterone are also linked to aggression because it is adaptive. Aggression towards rivals allows males to compete for the opportunity to mate with a fertile female. In addition, the fact that women tend children means that men are more likely to take the hunter role and success would be enhanced by aggressiveness.

Oestrogen

Oestrogen is a female hormone that determines female sexual characteristics and menstruation. Alongside the physical changes, oestrogen causes some women to experience heightened emotionality and irritability during their menstrual cycle. This is referred to as *premenstrual tension* (PMT) or *premenstrual syndrome* (PMS) when these effects become a diagnosable disorder. In extreme cases, PMS has been used (successfully) as a defence in cases of shoplifting and even murder. That said, some researchers dispute the existence of PMS as a viable medical category (see evaluation on facing page).

Oxytocin

Women typically produce oxytocin in much larger amounts than men, particularly as a result of giving birth. The hormone stimulates lactation, making it possible for mothers to breastfeed their children. It also reduces the stress hormone **cortisol** and facilitates bonding, for this reason it has been referred to as the 'love hormone'. Oxytocin is released in massive quantities during labour and after childbirth and makes new mothers feel 'in love' with their baby. The fact that men produce less of this hormone has, in the past, fuelled the popular stereotype that men are less interested in intimacy and closeness within a relationship. However, evidence suggests that both sexes produce oxytocin in roughly equal amounts during amorous activities such as kissing and sexual intercourse.

Apply it

Concepts

Congenital adrenal hyperplasia (CAH)

CAH is a rare genetic disorder that causes high prenatal levels of male hormones such as testosterone. The condition can affect males or females. However, it is more obvious in newborn baby girls (XX chromosomes) who may have ambiguous genitals due to the masculinising effect of the male hormones.

A study by Sheri Berenbaum and Michael Bailey (2003) found females with CAH are often described by their family and friends as tomboys, exhibit higher levels of aggression than other girls and show a preference for 'male' toys.

Question

This would appear to be sound evidence for the powerful influence of male sex hormones on gender behaviour. However, why might we be cautious when generalising findings from these cases?

Evaluation

Evidence for testosterone

One strength is that evidence supports the role of sex hormones in gender development even in mature males.

The link between increased testosterone and sexual behaviour was confirmed in a study by Christina Wang *et al.* (2000). Male hypogonadism is a condition caused by a man's testes failing to produce normal levels of the male sex hormone, testosterone. Wang *et al.* gave 227 hypogonadal men testosterone therapy for 180 days. Changes in body shape, muscle strength, sexual function and libido were all monitored across the period. Testosterone replacement improved sexual function, libido and mood, and significant increases in muscle strength were observed within the sample.

This study shows that testosterone exerts a powerful and direct influence on male sexual arousal, as well as physical development, in adulthood.

Counterpoint Other evidence on the effect of testosterone is rather less convincing. In a double-blind, placebo study, Daryl O'Connor *et al.* (2004) increased testosterone levels in healthy young men. There were no significant increases in the interactional (i.e. frequency of sexual intercourse) or non-interactional (i.e. sex-drive) components of sexual behaviour in participants. Notably, the men involved in the study experienced no change in their aggression or anger levels during the investigation either.

This suggests that additional testosterone may have no effect on sexual or aggressive behaviour – though this does not challenge the role of testosterone in early development.

Social factors ignored

One limitation of biological accounts is that they ignore the role of social factors in gender-related behaviour.

Geert Hofstede *et al.* (2010) claim that gender roles around the world are much more a consequence of social norms than biology. Indeed, these researchers equate notions of masculinity and femininity with whether whole cultures are **individualist** or **collectivist**. Countries that place individual competition and independence above the needs of community, are, according to Hofstede *et al.*, more *masculine* in their outlook. This would include advanced capitalist societies, such as the US and UK. Consequently, traditional masculine traits will be more highly valued within these societies.

This challenges biological explanations of gender behaviour and suggests social factors may ultimately be more important in shaping gender behaviour and attitudes.

Reductionist

Another limitation of biological explanations of gender is that they are **reductionist**.

Accounts that reduce gender to the level of chromosomes and hormones have been accused of ignoring or underplaying alternative explanations. The cognitive approach would draw attention to the influence of thought processes such as **schema** (see page 158). Even though changes in thought processes may come about through maturation of the developing brain, they are not adequately explained by the biological model. In addition, the **psychodynamic approach** (see page 160) would acknowedge maturation as a factor but point to the importance of childhood experiences such as interaction within the family.

This suggests that gender is more complex than its biological influences alone.

Evaluation eXtra

Pathologising gender

There are various conditions caused by changes in sex hormones. For example, *premenstrual syndrome* (PMS) is a recognised medical condition caused by fluctuating hormone levels during a woman's menstrual cycle. A diagnosis means a person can access treatment on the NHS to try to control the mood swings and physical symptoms they experience.

However, many commentators (e.g. Rodin 1992) object to the medical category PMS on the grounds that this stereotypes women's experience and emotion. They claim that PMS is a **social construction**, not a biological fact, which encourages damaging stereotypes of 'irrational woman', affecting how women are treated in society.

Consider: *Which perspective is preferable?*

Apply it Concepts — The case of David Reimer

Twin boys Bruce and Brian Reimer were born in Canada in 1965. Following a horrifically botched circumcision operation at six months of age, one of the twins – Bruce – was left without a penis.

Shortly after, Bruce's traumatised parents were made aware of the pioneering work of John Money, an up-and-coming psychologist who was developing his theory of 'gender neutrality' – that biological sex is less important than environmental influence when it comes to gender identity (i.e. our personal sense of what gender we are). In other words a biological male (or female) could be encouraged to take on a different gender identity, and this is what Money instructed the Reimers to do with their son. Bruce was raised in a stereotypically feminine way, dressed in girls' clothes and given dolls to play with. As he grew up, Bruce's progress was monitored by Money but Bruce was never told the truth of his gender reassignment.

By the time Brenda (as Bruce was now known) was in her teens, Money had written extensively of the success of the case – dramatic proof of his theory of neutrality. Unfortunately for Brenda, the reality was somewhat different. Brenda had never adjusted to life as a girl and woman and was experiencing severe psychological and emotional problems. When she was eventually told the truth about her childhood by her parents, she immediately went back to living as a man ('David'). Sadly there was no happy ending and David committed suicide in 2004.

Question

Explain why the distressing case of David Reimer is evidence that chromosomal influence is more powerful than environment in gender development.

Apply it Methods — Caster Semenya



Caster Semenya, a South African 800m runner, stormed to victory in the 2009 World Championships in Berlin at just 18 years of age. However, in the weeks that followed an Australian newspaper revealed that Semenya had been born intersex (a mixture of male and female biology). She was accused of 'cheating' because she was not 'truly' female. She had external female genitalia but no uterus or ovaries and had undescended testes. The newspaper left the impression that extra testosterone had assisted Semenya's performance and that she should be stripped of her gold medal (even though, often, in intersex cases, the body fails to make use of the increased testosterone).

Over the years there have been various rulings about Semenya's eligibility to compete. In 2018 the IAAF, athletics' governing body, ruled that women with high testosterone levels would have to take drugs to reduce their testosterone levels if they wished to compete.

Question

Explain how the Australian newspapers adopted a '**determinist**' approach in explaining Semenya's athletic performance.

Check it

1. Identify the chromosomal structure of: (a) males, **and** (b) females. *[2 marks]*
2. Outline the role of testosterone **and** oxytocin in gender development. *[2 marks + 2 marks]*
3. Outline the role of hormones in sex **and** gender. *[4 marks]*
4. Discuss the role of chromosomes **and** hormones in sex and gender. *[16 marks]*

Atypical sex chromosome patterns

The specification says...

Atypical sex chromosome patterns: Klinefelter's syndrome and Turner's syndrome.

Not all individuals conform to the typical XX or XY chromosome pattern. Two examples of atypical sex chromosome combinations are Klinefelter's and Turner's syndrome.

On this spread we explore the physical and psychological differences that are characteristic of these conditions. We also consider how atypical sex chromosome patterns can contribute to our understanding of the nature–nurture debate in gender development.

Key terms

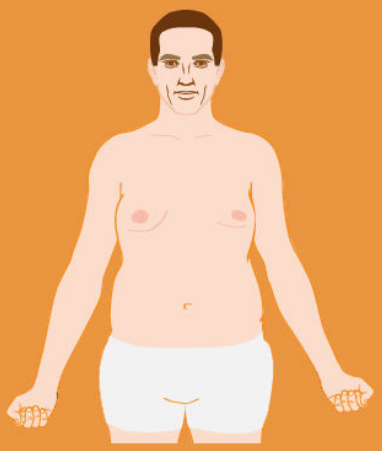
Atypical sex chromosome patterns Any sex chromosome pattern that deviates from the usual XX / XY formation and which tends to be associated with a distinct pattern of physical and psychological symptoms.

Klinefelter's syndrome A syndrome affecting males in which an individual's genotype has an extra X chromosome (in addition to the normal XY), characterised by a tall thin physique, small infertile testes, and enlarged breasts.

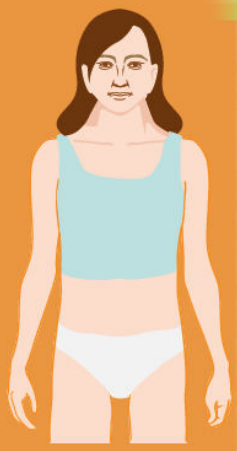
Turner's syndrome A chromosomal disorder in which affected women have only one X chromosome (denoted as XO), causing developmental abnormalities and infertility.

Study tip

Don't confuse the physical and psychological characteristics. Although both are relevant, the latter are more interesting to researchers trying to establish whether gender behaviour is biological or environmental.



The additional breast tissue and soft body contours associated with a man who has Klinefelter's syndrome.



A woman with Turner's syndrome may have a wide 'webbed' neck, a broad 'shield' chest and narrow hips.

Atypical sex chromosome patterns

Klinefelter's syndrome

Klinefelter's syndrome is an example of an **atypical sex chromosome pattern**. It affects about 1 in 600 males. Individuals who have this condition are biological males – with the anatomical appearance of a male – and have an additional X **chromosome**. As such, their sex chromosome structure is XXY. Although 10% of cases are identified by prenatal diagnosis, it is thought that around two-thirds of people who have Klinefelter's syndrome are not aware of it. Diagnosis often comes about accidentally via a medical examination for some unrelated condition.

Physical characteristics One of the effects of the additional X chromosome is reduced body hair when compared to an XY male. There may be some breast development at puberty (*gynaecomastia*) and a 'softening' or 'rounding' of body contours. Individuals with the syndrome tend to have long gangly limbs, underdeveloped genitals, reduced body hair and may have problems with co-ordination and general clumsiness. XXY men are also susceptible to health problems that are usually more commonly found in females, such as breast cancer.

Psychological characteristics In terms of psychological and behavioural characteristics, Klinefelter's syndrome is often linked to poorly developed language skills and reading ability. Individuals tend to be passive, shy and lack interest in sexual activity. Many tend not to respond well to stressful situations and may often exhibit problems with 'executive functions', such as memory and problem-solving.

Turner's syndrome

Approximately 1 in 5000 biological females have **Turner's syndrome**, caused by an absence of one of the two allotted X chromosomes – thus it is referred to as XO. This means that affected individuals have 45 chromosomes rather than the usual 46.

Physical characteristics Individuals with Turner's syndrome do not have a menstrual cycle (*amenorrhoea*), their ovaries do not develop and thus they are infertile. They do not develop breasts at puberty and instead have a broad 'shield' chest. Turner's syndrome is also associated with low set ears and a 'webbed' neck (an area of folded skin that runs along the neck to the shoulders). There is high waist-to-hip ratio in that the hips are not much bigger than the waist. Generally, adults with Turner's syndrome are physically immature and tend to retain the appearance of prepubescent girls.

Psychological characteristics In contrast to Klinefelter's syndrome, a feature of Turner's is higher-than-average reading ability. However, performance on spatial, visual memory and mathematical tasks is often lower than average. As well as immature appearance, people with Turner's syndrome tend to be socially immature, have trouble relating to their peers and experience difficulty 'fitting in'.

Apply it
Methods

Comparing the language skills of Klinefelter's individuals and chromosome-typical males

Ten chromosome-typical males and ten males with Klinefelter's syndrome were given a verbal fluency task that involved coming up with as many synonyms for the word 'big' as they could in two minutes.

The mean number of words for the chromosome-typical group was 14.4 and the mean number of words for the Klinefelter's group was 8.1.

Questions

1. Identify the type of **experimental design** used in the investigation described above. Explain your answer. (*2 marks*)
2. Explain *one* limitation of the experimental design you identified in question 1 in the context of the investigation above. (*3 marks*)
3. What is the most suitable graphical display to represent the mean values in the investigation above? Justify your choice. (*2 marks*)
4. What conclusion can be drawn from the **mean** values in the investigation above? (*2 marks*)
5. The **standard deviation** for the chromosome-typical group was 0.6 and the standard deviation for the Klinefelter's group was 3.2. What do the standard deviations tell us about the scores in each group? (*2 marks*)

Evaluation

Nature–nurture debate

One strength of research into atypical sex chromosome syndromes is its contribution to the **nature–nurture debate**.

By comparing people who have these syndromes with chromosome-typical individuals it becomes possible to see psychological and behavioural differences between the two groups (such as the finding that individuals with Turner's syndrome tend to have higher verbal ability and tend to talk more than 'typical' girls). It might be logically inferred that these differences have a biological basis and are a direct result of the abnormal chromosomal structure.

This would support the view that innate 'nature' influences have a powerful effect on psychology and behaviour.

Counterpoint However, there are issues in leaping to this conclusion. The relationship between the atypical chromosomal patterns associated with Klinefelter's and Turner's syndrome and the differences in behaviour seen in these individuals is not *causal*. It may be that environmental and social influences are more responsible for the behavioural differences observed. For instance, social immaturity seen in females with Turner's syndrome may arise from the fact that they are treated 'immaturely' by the people around them. Parents, teachers and others may react to the prepubescent appearance of people with Turner's in a way that encourages immature behaviour and this may have an indirect impact upon their performance at school (hence the specific learning and developmental problems identified).

This shows that it could be wrong to assume that psychological and behavioural differences in people with atypical sex chromosome patterns are due to nature.

Real-world application

Another strength of research is its application to managing the syndromes.

Continued research into atypical sex chromosome patterns is likely to lead to earlier and more accurate diagnoses of Turner's and Klinefelter's syndromes as well as more positive outcomes in the future. An Australian study of 87 individuals with Klinefelter's syndrome showed that those who had been identified and treated from a very young age experienced significant benefits in terms of managing their syndrome, compared to those who had been diagnosed in adulthood (Herlihy *et al.* 2011).

This suggests that increased awareness of atypical chromosome patterns does have a useful real-world application.

Sampling issue

One limitation with the description of Klinefelter's syndrome is there may be a sampling issue.

In order to identify the characteristics of XXY (and XO) individuals, it is necessary to identify a large number of individuals with the disorder and build a database. In this way we can see the full range of characteristics from mild to severe. In general, only those people who have the most severe symptoms are identified (see facing page) and therefore the picture of typical symptoms may be distorted. Richard Boada *et al.* (2009) report that prospective studies (following XXY individuals from birth) have produced a more accurate picture of the characteristics – many individuals with Klinefelter's do not experience significant cognitive or psychological problems, and many are highly successful academically, and in their personal lives and careers.

This suggests that the typical picture of Klinefelter's (and Turner's syndrome) may well be exaggerated.

Evaluation eXtra

Knowing or not knowing

Many people who have Klinefelter's or Turner's syndrome may be unaware of it (as mentioned on the facing page, two-thirds of people with Klinefelter's are unaware of it). This may be a good thing because it avoids a self-fulfilling prophecy – knowing you have the syndrome creates self-expectations of what your capabilities are.

On the other hand, early knowledge of the syndrome may help a person understand why they appear and act different from other children of the same age. This means that the child doesn't feel their physical and behavioural differences are 'their fault'. It also means that early access to medical and psychological support is possible.

Consider: *On balance, does it help or hinder a person's development to know they have such a syndrome?*

Apply it
Concepts

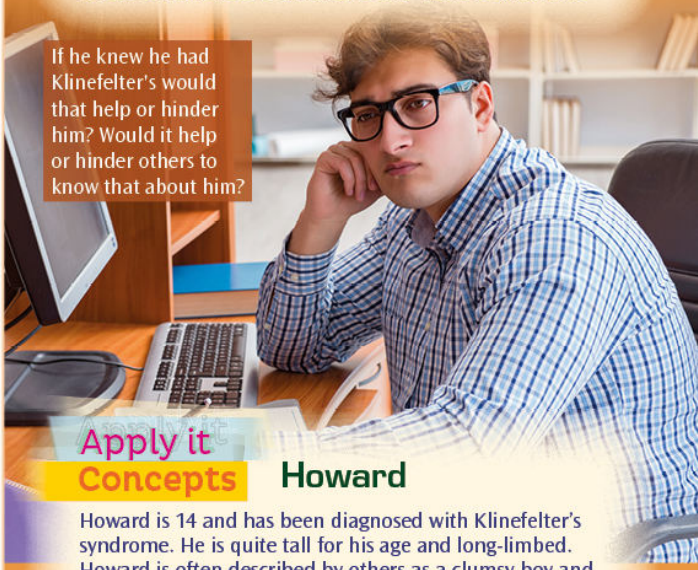
Treating Klinefelter's and Turner's syndrome

Testosterone replacement therapy can help people with Klinefelter's syndrome increase their hormone levels towards a typical range. This can produce bigger muscles, deepen the voice, and stimulate facial and body hair growth. Some XXY males can also benefit from fertility treatment to help them father children.

Growth hormone injections are beneficial for some individuals with Turner's syndrome. Injections often begin in early childhood and may increase final adult height by several centimetres. Oestrogen replacement therapy is usually started at the time of normal puberty to start breast development. Oestrogen and progesterone are given a little later to begin a monthly menstrual period, which is necessary to keep the womb healthy.

Question

Hormone replacement therapy may address some of the physical differences that people with Klinefelter's and Turner's syndrome may have. Outline the psychological effects of Klinefelter's syndrome and Turner's syndrome.



If he knew he had Klinefelter's would that help or hinder him? Would it help or hinder others to know that about him?

Apply it
Concepts

Howard

Howard is 14 and has been diagnosed with Klinefelter's syndrome. He is quite tall for his age and long-limbed. Howard is often described by others as a clumsy boy and although he has some close friends, he tends to be quite shy and passive at school.

Questions

1. Identify how Howard's sex chromosome pattern differs from that of most boys.
2. Explain how studying people like Howard can contribute to our understanding of gender.

Check it

1. Identify the atypical sex chromosome pattern for Turner's syndrome. *[1 mark]*
2. Identify **two** physical effects of Klinefelter's syndrome. *[2 marks]*
3. Explain **one** problem of studying people with atypical sex chromosomes. *[4 marks]*
4. Discuss atypical sex chromosome patterns **and** what they tell us about gender development. *[16 marks]*

Cognitive explanations: Kohlberg's theory

The specification says...

> Cognitive explanations of gender development, Kohlberg's theory, gender identity, gender stability and gender constancy.

There are several explanations of gender development, which we will examine over the next four spreads. Two are cognitive explanations, specifically *cognitive-developmental* because they share the view that a child's mental concept of gender becomes more sophisticated with age.

The first cognitive-developmental explanation was proposed by Lawrence Kohlberg who suggested that a child's understanding of gender develops in three stages.

Key terms

Gender identity A child recognises that they are a boy or a girl and possesses the ability to label others as such. In Kohlberg's theory, gender identity is acquired around age 2 years.

Gender stability Happens around age 4 years. A child understands that their own gender is fixed and they will be a man or a woman when they are older.

Gender constancy Usually reached by age 6 or 7 years. A child realises that gender remains the same over time and situations. They begin to identify with people of their own gender and start to behave in stereotypically gender-appropriate ways.

Apply it
Methods

Questioning children at different ages

In his research, Kohlberg interviewed children about their understanding of gender using a structured interview technique.

Questions

1. Outline what is meant by a **structured interview**. (*2 marks*)
2. Explain *one* limitation of using **interviews** with children to ask them about their understanding of gender. (*3 marks*)
3. Interviews often produce **qualitative data**. Explain *one* strength and *one* limitation of qualitative data. Refer to Kohlberg's interviews with children in your answer. (*6 marks*)

Study tip

Students often have difficulty distinguishing between gender stability and gender constancy. During stability, a child understands their own gender is permanent but cannot apply this to the people around them until they reach gender constancy. Then, the 'gender is fixed' idea is transferred to everybody.

Kohlberg's theory

Stages in development

Lawrence Kohlberg's (1966) cognitive-developmental theory of gender is based on the idea that a child's understanding of gender (including what counts as appropriate gender roles, behaviours and attitudes) becomes more sophisticated with age. But the link with age is not because of experience. It comes as a result of biological maturation – as the brain matures so does thinking.

Understanding of gender runs parallel to intellectual development as the child matures biologically (see the work of Piaget on the facing page). Gender development is thought to progress through three stages. The ages suggested by Kohlberg are approximate and reflect the fact that the transition from stage to stage is gradual rather than sudden.

Stage 1: Gender identity

Around the age of 2 years, Kohlberg proposed that children are able to correctly identify themselves as a boy or a girl. This is **gender identity**. At 3 years, most children are able to identify other people as boys/men or girls/women, and can correctly respond to questions such as, 'Which one of these is like you?' if they are shown a picture of a man or a woman. Their *understanding* of gender tends not to stretch much beyond simple labelling, however. Often children of this age group do not view gender as fixed. For instance, a two-and-a-half-year-old boy may be heard to say 'when I grow up I will be a mummy'.

Stage 2: Gender stability

According to Kohlberg, at age 4 years, children acquire **gender stability**. With this comes the realisation that they will always stay the same gender, i.e. this aspect of themselves stays the same *over time*. That said, children of this age cannot apply this logic to other people in other situations. They are often confused by external changes in appearance – they may describe a man who has long hair as a woman and they also believe that people change gender if they engage in activities that are more often associated with a different gender (such as a builder who is a woman or a nurse who is a man).

Stage 3: Gender constancy

Gender constancy appears in the final stage of development. Kohlberg claimed that, around the age of 6 years, children recognise that gender remains constant across time and situations, and this understanding is applied to other people's gender as well as their own. As a consequence, they are no longer fooled by changes in outward appearance. Although they may regard a man wearing a dress as unusual, a child is able to understand that he is still a man 'underneath'.

Gender constancy is also significant in that children of this age begin to seek out gender-appropriate role models to identify with and imitate. As we shall see, this connects closely with ideas in **social learning theory** (though social learning theorists, in contrast, argue that these processes can occur at any age rather than only after the age of 6).

For Kohlberg, once a child has a fully developed and internalised concept of gender at the constancy stage, they embark upon an active search for evidence which confirms that concept. A tendency towards gender stereotyping begins to emerge at this age.

Apply it
Concepts

Questioning children at different ages

Place a tick or cross in the appropriate box based on whether a boy of that age could answer the question correctly.

Question	Age 3	Age 5	Age 7
Are you a boy or a girl?			
When you were a baby, were you a boy or a girl?			
When you grow up, will you be a mummy or a daddy?			
Could you ever be a mummy?			
If you wore a dress, would you be a girl?			



Evaluation

Research support

One strength of Kohlberg's stage theory is evidence suggests that gender stereotyping does emerge around the age of 6 (gender constancy stage) as he predicted.

William Damon (1977) told children a story about George, a boy who liked to play with dolls. The children were asked to comment on the story. Four-year-olds said it was fine for George to play with dolls if he wanted to. In contrast, six-year-olds thought it was wrong for George to play with dolls. They had gone beyond understanding what boys and girls do, to developing rules about what they ought to do (gender stereotyping).

This would suggest that children who have, as predicted, achieved constancy have formed rigid stereotypes regarding gender-appropriate behaviour.

Counterpoint Other research challenges the idea that an interest in gender-appropriate behaviour only develops around age 6. Kay Bussey and Albert Bandura (1999) found that children as young as four reported 'feeling good' about playing with gender-appropriate toys and 'bad' about doing the opposite.

This contradicts what Kohlberg's theory would predict, but may support gender schema theory (see next spread), which suggests that children begin to absorb gender-appropriate information as soon as they identify themselves as either a boy or a girl (gender identity).

Methodological problem

One limitation of Kohlberg's theory is that supporting research relies on unsatisfactory methods to assess gender constancy.

Sandra Bem (1989) has criticised the methodology used in many studies of the link between gender and cognitive development. The key test of gender constancy in such studies is whether a child understands that gender stays the same despite changes in appearance and context. Bem argued it is little wonder younger children are confused by this as, in our culture, this is how we demarcate one gender from another. We identify men and women through things like the clothes they wear and their hairstyle. In reality, the best way to identify males and females is through physical differences, such as genitalia – something that younger children apparently do not understand. In her own study, Bem demonstrated that 40% of children aged 3–5 years were able to demonstrate constancy if they were shown a naked photo of the child-to-be-identified first (i.e. they based their judgements on more than clothing).

This suggests that the typical way of testing gender constancy may misrepresent what younger children actually know.

Degrees of constancy

A further limitation of Kohlberg's theory is that other researchers have suggested there may be different degrees of gender constancy.

Carol Martin *et al.* (2002) praise Kohlberg's theory for recognising that children's understanding of their own and other people's gender guides their thoughts and behaviour. They point out though that exactly when and how this understanding affects children's gender-related behaviour remains unclear. Martin *et al.* suggest there may be different degrees of gender constancy. An initial degree may orient children to the importance of gender – in choosing friends or seeking information, for instance – and this may develop before the age of 6 (as the Bussey and Bandura study above suggests). A second degree of constancy (which develops later) may heighten children's responsiveness to gender norms, particularly under conditions of conflict, such as choosing appropriate clothes or attitudes.

This suggests that the acquisition of constancy may be a more gradual process and may begin earlier than Kohlberg thought.

Evaluation eXtra

Nature or nurture?

Kohlberg's stages are influenced by changes in the developing brain and increased intellectual capacity with age – a nature approach. This is supported by cross-cultural studies (e.g. Munroe *et al.* 1984) which suggest that the cognitive changes described may be universal, and therefore biological.

That said, although Kohlberg claims that children search for confirmation of gender stereotypes in the constancy stage, he fails to properly account for the socialisation process in the development of gender early on. Bussey and Bandura (1999), in their social-cognitive theory of gender, claim that social processes of observation, imitation and identification with role models play a much more influential role in gender development than cognitive structures.

Consider: *Are our concepts of gender more a matter of nature or nurture?*

Apply it
Concepts

Piaget, egocentrism and conservation

Kohlberg's stage theory was heavily influenced by the cognitive-developmental theory of Jean Piaget (1926) (see page 180). Piaget described all children as egocentric until the age of around 6 or 7. In other words, they assume everyone sees the world in the same way as they do. When they decentre, children begin to appreciate that other people's views and feelings may not always match their own.

Piaget also introduced the notion of 'conservation'. Older children acquire the understanding that the properties of an object (the object's 'essence') remain the same even when its outward appearance changes. This also occurs around age 6 or 7. For instance, the same amount of liquid may 'look' different when placed in a different sized glass but the volume of liquid (provided none is spilt or drunk!) remains the same.

Questions

1. How can Piaget's concept of egocentrism be used to explain the errors children make in the gender stability stage?
2. How can Piaget's concept of conservation be used to explain the mental leap forward that children make at the gender constancy stage?



When playing hide and seek, a young child will often be found covering their eyes … they assume that if they cannot see you, you cannot see them!

Piaget would describe this as egocentric behaviour, which may offer an explanation for gender stability.

Apply it
Concepts

Bryan and Ryan

Bryan is 3 years old. When his nursery school teacher asks him what he will be when he grows up, Bryan replies, 'I will be a mummy'.

Ryan is 5. When his mum tells him that daddy has a new job as a nurse, Ryan is shocked. 'Does that mean daddy is a lady now?' asks Ryan.

Questions

1. What is meant by 'gender stability'? Refer to the comment made by Bryan as part of your answer.
2. What is meant by 'gender constancy'? Refer to Ryan's question as part of your answer.

Check it

1. Explain what is meant by 'gender constancy'. *[3 marks]*
2. Explain the difference between gender stability and gender constancy. *[4 marks]*
3. Explain **one** limitation of Kohlberg's theory of gender development. *[3 marks]*
4. Outline **and** evaluate Kohlberg's theory of gender development. *[16 marks]*

Cognitive explanations: Gender schema theory

The specification says...

Cognitive explanations of gender development, gender schema theory.

On the previous spread we looked at Kohlberg's cognitive-developmental explanation of gender development. A second cognitive-developmental theory of gender is Carol Martin and Charles Halverson's gender schema theory. As would be expected of an explanation within the same approach, there are a number of similarities between gender schema theory and Lawrence Kohlberg's stage theory, but also some important differences.

Key term

Gender schema An organised set of beliefs and expectations related to gender that are derived from experience. Such schema guide a person's understanding of their own gender and stereotypically gender-appropriate behaviour in general.



Gender schema theory (GST)

Like Kohlberg's theory, Carol Martin and Charles Halverson's (1981) account is a cognitive-developmental theory which argues that children's understanding of gender changes with age (i.e. it is 'developmental'). Also, gender schema theory shares Kohlberg's view that children develop their understanding of gender by *actively* structuring their own learning, rather than by *passively* observing and imitating role models (the view proposed by **social learning theory**, described on page 162).

Gender schema after gender identity

Schema is a concept that was introduced as part of the cognitive approach. Schema are mental constructs that develop via experience (though some are present at birth in a basic form) and are used by our cognitive system to organise knowledge around particular topics. Thus, a gender schema is a generalised representation of everything we know in relation to gender and stereotypically gender-appropriate behaviour.

According to Martin and Halverson, once a child has established **gender identity** around the age of 2–3 years he or she will begin to search the environment for information that encourages development of gender schema. This contrasts with Kohlberg's view that this process only begins *after* they have progressed through all three stages, around age 7 with **gender constancy**.

Gender schema determine behaviour

Gender schema expand to include a wide range of behaviours and personality traits. For young children, schema are likely to be formed around stereotypes, such as boys play with trucks and girls play with dolls, and these provide a framework that directs experience as well as the child's understanding of itself ('I am a boy so I play with trucks'). By 6 years of age, children have a rather fixed and stereotypical idea about what is appropriate for their gender.

For this reason, children are likely to misremember or disregard information that does not fit with their existing schema (see Martin and Halverson's study – facing page).

Ingroup information better remembered

Children tend to have a much better understanding of the schema that are appropriate to their own gender (the **ingroup**). This is consistent with the idea that children pay more attention to information relevant to their gender identity, rather than that of the other gender (the **outgroup**). It is not until children are a little older (around 8) that they develop elaborate schema for *both* genders, as opposed to just their own. Ingroup identity also serves to bolster the child's level of **self-esteem**.

Apply it Concepts

Jessica's plans

Jessica is 6 years old and is talking to her mum about what she wants to do when she grows up.

'I want to be a doctor because doctors are caring and kind,' says Jessica.

'That's nice,' says her mum, 'and will you get married?'

'Yes I will,' replies Jessica, 'and I'll wear a beautiful pink wedding dress with a bow in my hair and carry flowers.'

'Lovely,' says her mum, 'and what will your husband wear?'

Jessica thinks for a minute and finally replies, 'I don't really know what boys wear at weddings.'

Question

Use your knowledge of gender schema theory to explain the conversation between Jessica and her mum.

Apply it Methods

Recall of gender-appropriate and gender-inappropriate images

A study investigated whether six-year-old children were more likely to recall stereotypically gender-appropriate or gender-inappropriate images. Twenty children were shown ten photographs of adults performing gender-appropriate activities (such as a woman washing the dishes) and a further ten photographs of adults performing gender-inappropriate activities (such as a man bottle-feeding a baby).

A week later, the children were tested on their recall of all the photographs they had seen.

Questions

1. Write a **directional hypothesis** for the research study above. (*2 marks*)
2. Explain how **counterbalancing** could have been used in the research study above. (*2 marks*)
3. Of the 20 children tested, 15 of them recalled more of the gender-appropriate photographs than the gender-inappropriate photographs. What percentage of the total number of children recalled more of the gender-appropriate photographs? Show your calculations. (*2 marks*)
4. The investigation above used a **repeated measures design**. Explain how the investigation could be redesigned using a **matched pairs design**. (*3 marks*)

Evaluation

Research support

One strength of gender schema theory is that its key principles are supported by evidence.

Martin and Halverson's (1983) own study found that children under the age of 6 were more likely to remember photographs of stereotypically gender-appropriate behaviour (such as a woman washing the dishes) than photographs of gender-inappropriate behaviour (such as a woman fixing the car) when tested a week later. Children tended to change the gender of the person carrying out the gender-inappropriate activity in the photographs when asked to recall them so that the gender behaviour was now appropriate.

This provides support for gender schema theory which predicts that children under 6 years would do this (in contrast with Kohlberg who predicted this would only happen when children are older).

Earlier gender identity

One limitation of gender schema theory is that gender identity probably develops earlier than Martin and Halverson suggested.

A **longitudinal** study of 82 children (Zosuls *et al.* 2009) looked at the onset of gender identity. Data was obtained from twice-weekly reports from mothers on their children's language from age 9 to 21 months, alongside videotaped analysis of the children at play. The key measure of gender identity was taken to be how and when children labelled themselves as a 'boy' or 'girl'. This occurred, on average, at 19 months – almost as soon as children begin to communicate, which suggests that children actually have a gender identity before this but just don't communicate it.

This suggests that Martin and Halverson may have underestimated children's ability to use gender labels about themselves.

Counterpoint However, it may not be appropriate to argue about specific ages for Martin and Halverson's theory. They suggest that the key point is the shifts in a child's thinking and that the ages are *averages* rather than absolutes. It is possible that many children may move through stages quicker or slower than others. It is the *sequence* of development that is more important.

This suggests that Zosuls *et al.*'s finding is not a fundamental criticism of the theory.

Cultural differences

Another strength is that gender schema theory can account for cultural differences in stereotypically gender-appropriate behaviour.

Kendra Cherry (2019) argues that gender schema not only influence how people process information but also what counts as culturally-appropriate gender behaviour. Traditional cultures, that believe women should take a nurturing role and that men should pursue a career, will raise children who form schema which are consistent with this view. In societies where perceptions of gender have less rigid boundaries, children are more likely to acquire more fluid gender schema. The point is that Martin and Halverson's theory can explain how gender schema are transmitted between members of a society and how cultural differences in gender stereotypes come about.

This contrasts with some other explanations of gender development, such as psychodynamic theory (next spread), which suggests gender identity is more driven by unconscious biological urges.

Evaluation eXtra

Timing

Kohlberg's and Martin and Halverson's theories agree that children play an active role in their own gender development, searching the environment for what counts as stereotypically gender-appropriate behaviour. However, they disagree on when this starts to happen. Kohlberg argues that children must achieve gender constancy before they begin to demonstrate gender-appropriate behaviour (at age 6). Once they have, they look for gender-appropriate role models to imitate.

In contrast, Martin and Halverson argue that children start to show signs of gender-appropriate behaviour shortly after they have achieved gender identity (around the age of 2 years). This is because children are in the process of building an ingroup gender schema, and so will select behaviours that correspond with their gender.

Consider: *When is it likely that gender-appropriate behaviour begins?*

Apply it

Concepts

Representation of gender – Disney at the movies

If children require confirmation of their gender schema then they need look no further than Disney animations. There are stark differences in the way in which genders have traditionally been portrayed in Disney films. Leading men (and boys) are typically independent, assertive, intelligent, athletic, important, competent, responsible and stronger than women (and girls). For example, Tarzan, Prince Charming and Hercules all conform to the alpha-male stereotype.

In contrast, women have often been portrayed as weaker, more controlled by others, emotional, warmer, romantic, affectionate, sensitive, passive, complaining, domestic and more troublesome than men. Step forward Snow White, Sleeping Beauty, *et al*.

Question

More recent Disney films have sought to challenge traditional gender stereotypes. Can you think of any examples?



Did you assume this was a nurse or doctor? Do people tend to 'see' pictures along stereotypical lines, i.e. they default to gender consistency?

Study tip

You can use studies, such as the Martin and Halverson study, when writing essays either as part of description or as evaluation. If you do use them as part of evaluation then you should keep your description of these to a minimum. The main focus should be on how the study supports (or challenges) the theory. A useful phrase is 'This suggests that ... '.

In this case, the Martin and Halverson study supports gender schema theory as it demonstrates how children will disregard or misremember information that is not appropriate with their existing gender schema.

This is the important bit to emphasise in evaluation – rather than a detailed description of the study's procedure and findings.

Check it

1. Explain what is meant by 'gender schema'. *[3 marks]*
2. Explain differences between gender schema theory and Kohlberg's theory of gender development. *[6 marks]*
3. Evaluate gender schema theory *[10 marks]*
4. Discuss gender schema theory. *[16 marks]*

Other explanations of gender development: Psychodynamic

The specification says...

Psychodynamic explanation of gender development, Freud's psychoanalytic theory, Oedipus complex; Electra complex; identification and internalisation.

You are already familiar with Sigmund Freud's psychodynamic approach from your study of psychological approaches in Year 1. His ideas, often considered controversial and unusual, have been applied to many topic areas including the development of gender.

Key terms

Oedipus complex Freud's explanation of how a boy resolves his love for his mother and feelings of rivalry towards his father by identifying with his father.

Electra complex A term proposed by the neo-Freudian Carl Jung which refers to a process similar to the Oedipus complex. In girls, an attraction to and envy of their father is resolved through identification with their mother.

Identification A desire to be associated with a particular person or group often because the person/group possesses certain desirable characteristics.

Internalisation An individual adopts the attitudes and/or behaviour of another.



Daddy's boy. To resolve the Oedipus and Electra complexes, children identify with their same-sex parent and internalise that parent's gender identity.

Freud's psychoanalytic theory

Pre-phallic children

Freud's (e.g. 1905) general developmental theory sees children pass through five biologically-driven **psychosexual stages** that begin with the **oral stage** and end with the **genital stage** around the time of puberty. The third of these stages – the **phallic stage** – is when gender development occurs, between the ages of 3 and 6 years. Prior to reaching the phallic stage, children have no concept of **gender identity**. They have no understanding of 'male' or 'female' and so do not categorise themselves or others in that way. In the phallic stage, the focus of pleasure for the child switches to the genitals, and it is within this stage that children experience the **Oedipus complex** (boys) or the **Electra complex** (girls). These stages are crucial in the formation of gender identity.

Oedipus complex

In the phallic stage, boys develop incestuous feelings towards their mother. They harbour a jealous and murderous hatred for their father who stands in the way of the boy possessing his mother. However, the boy also recognises that his father is more powerful than he is and fears he may be castrated by his father for his feelings towards his mother, leading to **castration anxiety**.

To resolve the conflict, the boy gives up his love for his mother and begins to identify with his father.

Electra complex

Freud (1909) suggested that, in the phallic stage, girls experience **penis envy**, seeing themselves and their mother as being in competition for their father's love. Girls develop a double-resentment towards their mother. First, the mother is a love rival standing in the way of the father, and second, the mother is blamed by their daughter for having no penis (the daughter believes she was castrated by her mother at the same time as the mother castrated herself).

The concept of the Electra complex came from Carl Jung who suggested that girls, over time, come to accept that they will never have a penis and substitute penis envy with the desire to have children, identifying with their mothers as a result.

Identification and internalisation

The crux of Freud's theory is that children of both sexes identify (**identification**) with the same-gender parent as a means of resolving their respective complexes. Boys adopt the attitudes and values of their father, and girls adopt those of their mother. This involves children taking on board the gender identity of the same-gender parent, a process Freud referred to as **internalisation**. Essentially then, both boys and girls receive a 'second-hand' gender identity *all at once* at the end of the phallic stage.

Little Hans

Freud's evidence for the existence of the Oedipus complex was limited but he did present the case of Little Hans to illustrate the concept. Hans was a five-year-old boy with a morbid fear of being bitten by a horse. Hans's fear appeared to have stemmed from an incident when he had seen a horse collapse and die in the street. However, Freud's interpretation was that Hans's fear of being bitten represented his fear of castration (by his father because of Hans's love for his mother). Freud suggested that Hans had transferred his fear of his father onto horses via the unconscious defence mechanism of **displacement**.

Apply it Methods: Little Hans

The case of Little Hans is described above. Much of the analysis of Hans's phobia was conducted by his father – Max Graf – who explained the development of his son's condition to Freud through a series of letters.

Questions

1. Explain how the case of Little Hans supports the existence of the Oedipus complex. (*2 marks*)
2. Discuss the strengths and limitations of the **case study** approach in psychology. Refer to the case of Little Hans in your answer. (*8 marks*)
3. Explain how Freud's case study of Little Hans is an example of the use of **secondary data**. (*2 marks*)
4. Evaluate the use of secondary data in psychological research. Refer to the case of Little Hans in your answer. (*4 marks*)

Evaluation

The Oedipus complex

One strength of Freud's theory is there is some support for the role of the Oedipus complex in gender development.

Freud's explanation of gender development means that, for boys, 'normal' development depends on being raised by at least one male parent. There is some support for this idea. George Rekers and Shasta Morey (1990) rated the gender identity of 49 boys aged 3–11 years based on **interviews** with their families and the children themselves. Of those who were judged to be 'gender disturbed', 75% had neither their biological father nor a substitute father living with them.

This suggests that being raised with no father may have a negative impact upon gender identity – in line with what Freud's theory would predict.

Counterpoint Generally though, the relationship between absent fathers and problems of gender identity is not supported. A study by Henny Bos and Theo Sandfort (2010) compared data from 63 children where both parents were lesbians and 68 children from 'traditional' families. Children raised by lesbian parents felt less pressure to conform to gender stereotypes and were less likely to assume their own gender was superior, but there were no differences in terms of psychosocial adjustment or gender identity.

This contradicts Freud's theory as it suggests that fathers are not necessary for healthy gender identity development.

Female development

One limitation is Freud's inadequate account of women's development.

Although Freud wrote extensively about the Oedipus complex, much of the theorising on girls' parallel development was undertaken by Carl Jung, one of Freud's contemporaries, who also produced a psychoanalytic theory. Freud admitted that women were a mystery to him and his notion of penis envy has been criticised as reflecting the androcentric Victorian era during which he lived where men held so much power. Indeed, the feminist psychoanalyst Karen Horney (1942) argues that a more powerful emotion than penis envy is men's experience of 'womb envy' – a reaction to women's ability to nurture and sustain life. Horney argued that penis envy (like womb envy) was a result of cultural rather than biological factors.

This challenges the idea that women's gender development is founded on a desire to want to be like a man (an **androcentric bias**).

Pseudoscientific

Another limitation is that the psychodynamic explanation lacks scientific credibility.

Freud has often been criticised for the lack of rigour in his methods (using subjective case studies). Also many of his concepts (such as penis envy) are untestable because they are largely **unconscious**. This contrasts sharply with other explanations of gender that are based on objective, verifiable evidence derived from controlled lab studies. According to the philosopher of science Karl Popper (1959), this makes Freud's theory **pseudoscientific** (not genuine science) as his key ideas cannot be **falsified**, i.e. proved wrong through scientific testing.

This questions the **validity** of Freud's theory as it is not based on sound scientific evidence.

Evaluation eXtra

The nature of development

Freud argued that children do not begin to show gender-appropriate behaviour until after age 6 years (when the Oedipus/Electra conflict is resolved). To some extent this agrees with Kohlberg's theory which suggests that children only begin to act in a gender-appropriate way after they have achieved gender constancy (also around 6).

Where there is disagreement however is that Kohlberg suggests that the child's concept of gender develops gradually, via a sequence of stages as the child's cognitive capacity increases. Freud sees no such gradual build-up and instead suggests that gender is acquired all at once – in *one fell swoop*.

Consider: *Which view of the development of gender identity seems to better fit the facts?*



Young boys are possessive and protective of their mothers. Towards the end of the phallic stage, their attentions switch to their fathers, according to Freud.

Apply it Concepts

Is my son behaving normally?

The following letter appeared in the agony aunt column of a newspaper.

Dear Deirdre,

I am currently experiencing some issues with my five-year-old son. He used to be a very loving little boy who always enjoyed cuddles and kisses from me. Our relationship was so close that he would often upset his father by refusing to go to him when he was frightened or upset.

More recently, however, my son has been rejecting my affections, and prefers to spend time with his father. On the one hand, I am pleased that they have suddenly become much closer (and my husband is delighted). However, I cannot hide my sadness at how my little boy now seems to push me away.

Is this normal? Do all mums experience this?

Question

Write a reply to the mother's letter based on psychoanalytic theory.

Apply it Concepts

The gender difference in Freudian gender identity

According to Freud, because the threat of castration is not present for girls in the phallic stage, they are not under the same pressure as boys to identify with the same-gender parent. This means that girls develop a weaker gender identity than boys.

Although this is debatable, it does seem to be the case that boys are more reluctant than girls to engage in counter-stereotype behaviour that might be construed as 'feminine'. This would imply that boys develop a strong masculine identity at a relatively early age, suggesting Freud may have been right.

Question

What alternative explanations may be given for boys' unwillingness to engage in feminine behaviour?

Check it

1. Outline the difference between 'identification' **and** 'internalisation' in Freud's psychoanalytic theory of gender. *[4 marks]*
2. Explain the Oedipus complex. Refer to Freud's psychoanalytic theory of gender development in your answer. *[4 marks]*
3. Evaluate the Oedipus complex in Freud's psychoanalytic theory of gender development. *[6 marks]*
4. Discuss Freud's psychoanalytic theory of gender development. *[16 marks]*

Other explanations of gender development: Social learning

The specification says...

Social learning theory as applied to gender development.

In the Year 1 course social learning theory (SLT) was introduced as one of two learning approaches (the other being behaviourism). Social learning theory has been applied to a number of different topic areas including gender development.

Children are seen to acquire their gender identity – and associated gender-appropriate behaviour – through key social learning concepts of vicarious reinforcement, identification and modelling.

Key term

Social learning theory (SLT) A way of explaining behaviour that includes both direct and indirect reinforcement, combining learning theory with the role of cognitive factors.

Apply it Concepts — Mediational processes

Five-year-old Mary watched intently as her mum applied her make-up. She paid careful attention to the way her mum added the lipstick and darkened her eyelashes with a brush. Mary also noticed how her father described her mother as 'beautiful' when he entered the room.

When left alone, Mary sneaked back into her mum's room and proceeded to give herself a makeover. Unfortunately, she ended up getting mascara in her eye and lipstick all over her face.

Question

Use the four mediational processes of social learning theory (see right) to explain Mary's experiences.

Social learning theory as applied to gender development

Social learning theory (SLT) acknowledges the role that the social context plays in development and states that all behaviour (including gender-related behaviour) is learned from observing others. As such, SLT draws attention to the influence of the environment (**nurture**) in shaping gender development. This includes significant others that a child comes into contact with – parents, peers and teachers amongst others – as well as the wider influence of **culture** and the **media** (see next spread).

Direct reinforcement Children are more likely to be reinforced (praised, encouraged) for demonstrating behaviour that is stereotypically gender-appropriate. For instance, boys may be encouraged to be active, assertive and engage in rough-and-tumble play. In contrast, girls are likely to be rewarded for being passive, gentle and staying close to their parent. The way in which boys and girls are encouraged to show distinct gender-appropriate behaviour is called **differential reinforcement**. It is through differential reinforcement that a child learns their gender identity (I am a boy).

A child is more likely to repeat a behaviour that has been reinforced (rewarded). This reinforcement may be direct or indirect.

Indirect (vicarious) reinforcement If the consequences of another person's behaviour are favourable, that behaviour is more likely to be imitated by a child. For instance, if a little girl sees her mother receive a compliment when she wears make-up and a pretty dress, the girl may try and repeat this behaviour when she is able.

If the consequences of behaviour are seen to be unfavourable, i.e. punished, behaviour is less likely to be imitated. If a little boy sees another boy teased for displaying feminine behaviour, such behaviour is unlikely to be copied.

Identification and modelling

Identification refers to the process whereby a child attaches themself to a person who is seen to be 'like me' or to a person who 'I want to be'. In short, the person possesses qualities that the child sees as desirable. These people are known as **role models** and may be part of the child's immediate environment (parents, teachers, siblings, etc.) or may be present within the media, such as pop stars or sports stars. Role models tend to be attractive, high status and are usually (and crucially for learning gender behaviours) the same gender as the child.

From the role model's perspective, **modelling** is the precise demonstration of a behaviour that may be imitated by an observer. A mother may model stereotypically feminine behaviour when tidying the house or preparing dinner. The same term is also used to explain learning from the observer's perspective. When a little girl copies her mother setting the table, or attempts to 'feed' her doll using a toy bottle, she is modelling the behaviour she has witnessed.

Mediational processes

Social learning theorists have also suggested four mediational (cognitive) processes that are central to the learning of gender behaviour:

- *Attention* – for instance, a little boy might want to emulate his favourite Premier League footballer by paying close *attention* to what the footballer does.
- *Retention* – remembering the skills the footballer showed on the pitch and trying to reproduce these in the playground later with friends.
- *Motivation* – the desire to repeat the behaviour comes from wanting to be like his hero (identification).
- *Motor reproduction* – the boy must be physically capable of doing it.



Apply it Concepts — Playtime

Using the key social learning theory concepts described above, explain the gender differences in children's play in the picture on the left.

Question

In your answer, make sure you make some reference to each of the following:

- Imitation
- Identification
- Reinforcement (direct and vicarious)
- Modelling

Evaluation

Research support

One strength of the social learning approach is that key principles are supported by evidence.

A classic study by Caroline Smith and Barbara Lloyd (1978) involved babies aged 4–6 months who (irrespective of their actual sex) were dressed half the time in boys' clothes and half the time in girls' clothes. When observed interacting with adults, babies assumed to be a 'boy' were more likely to be given a hammer-shaped rattle and encouraged to be adventurous and active. When the same babies were dressed as girls they were more likely to be handed a cuddly doll, told they were 'pretty' and reinforced for being passive.

This suggests that gender-appropriate behaviour is stamped in at an early age through differential reinforcement, supporting social learning theory.

Counterpoint However, differential reinforcement may not be the *cause* of gender differences in behaviour. Indeed, adults, during interactions with their own children, may simply be responding to innate gender differences that are already there. For example, the observation that boys are encouraged to be more active during play may be a consequence of the fact that they are naturally more active anyway, due to hormonal differences.

This suggests that it is likely that social learning is only part of the explanation of how children acquire gender-related behaviours.

Cultural changes

Another strength is that social learning can explain cultural changes in stereotypically gender-appropriate behaviour.

We noted earlier, when explaining androgyny, that there exists less of a clear-cut distinction between what people regard as stereotypically masculine and feminine behaviour in many societies today than there was in, say, the 1950s. As there has been no corresponding change in people's basic biology within the same period, such a shift is much better explained by social learning theory than the biological approach. The shift in social expectations and cultural norms over the years has meant new forms of gender behaviour are now unlikely to be punished and may be reinforced.

This shows that social learning is one approach that can explain cultural changes in gender behaviour (cognitive factors could also be used to explain cultural changes in terms of schema/stereotypes).

No developmental sequence

One limitation is that social learning theory does not provide an adequate explanation of how learning processes change with age.

The general implication of the social learning approach is that modelling of gender-appropriate behaviour can occur at any age, i.e. from birth onwards. However, it seems illogical that children who are, say, two years old learn in the same way as children who are nine years old. This conflicts with, for example, Kohlberg's theory (see page 156) that children do not become active in their gender development until they reach gender constancy.

This suggests that influence of age and maturation (i.e. development) on learning gender concepts is not a factor considered by social learning theory.

Evaluation eXtra

Identification

Freud's psychodynamic explanation, like social learning theory, makes reference to the importance of identification in gender development. Freud claimed the most important single influence on the child is the same-gender parent, whose gender identity they internalise.

In contrast, the social learning view of identification is more all-encompassing than Freud's version and would include a whole host of gender-appropriate role models, alongside the same-gender parent. These may be physically present in the environment or symbolic – for example, siblings, peers or people in the media. The implication is, for social learning theorists, that the same-gender parent is important, but not the 'be-all and end-all' in terms of influence.

Consider: *Which account of identification is more likely?*

Two birthday cards for an eight-year-old, but which one is for a girl and which for a boy?



Apply it Methods — Oranges and bananas

Psychologists conducted a laboratory experiment to see whether children were more likely to select a particular fruit if they had seen a same-gender role model choose the same fruit earlier (based on Perry and Bussey 1979). In the experiment 20 girls and 20 boys aged between 8 and 10 years were shown a short film of a man and woman selecting fruit from a bowl. The man chose an orange and the woman chose a banana.

The children were then presented with a fruit bowl which contained a selection of fruits (including an orange and a banana) and their chosen fruit was recorded.

Questions

1. Outline *one* strength of a **laboratory experiment**. Refer to the investigation above in your answer. (*3 marks*)
2. Identify *one* possible **extraneous variable** in the experiment above. Explain *why* this variable should be controlled and *how* it could be controlled. (*3 marks*)
3. Write a set of **standardised instructions** that could be read out to the participants in the experiment above. (*4 marks*)

Study tip

If you write about the social learning theory of gender development you must apply the theory to gender development rather than producing a general essay on social learning theory. The best way to do this is to use examples that relate to gender to illustrate the key features of social learning theory.

Apply it Concepts — Lily and Millie

Lily and Millie are two six-year-old girls. Lily is very feminine and loves to wear pink frilly dresses and play with dolls. She is calm and softly spoken. Millie, on the other hand, is loud and boisterous. She enjoys running around, playing football and is often described as a 'tomboy' by other members of her family.

Questions

1. How would biological explanations of gender account for the differences in behaviour of Lily and Millie?
2. How would social learning theory account for the differences in behaviour of Lily and Millie?

Check it

1. Briefly explain social learning theory as applied to gender development. *[3 marks]*
2. Explain **one** difference between social learning theory as applied to gender development and gender schema theory. *[2 marks]*
3. Explain **one** limitation of social learning theory as applied to gender development. *[6 marks]*
4. Outline **and** evaluate the social learning theory of gender development. *[16 marks]*

The influence of culture and media on gender roles

The specification says...

The influence of culture and media on gender roles.

Social learning theorists (previous spread) see gender-role behaviour as largely determined by the environment and socialisation. Two key areas through which social norms are transmitted and communicated are culture and the media.

Indeed, these may be linked in the sense that the media (TV, film, etc.) reflect and confirm dominant cultural norms of gender roles.

Key terms

Culture The ideas, customs and social behaviour of a particular group of people or society.

Media Communication channels, such as TV, film and books, through which news, entertainment, education and data are made available.

Gender roles A set of behaviours and attitudes that are considered typical of one gender and atypical of the other.

Apply it Concepts

Third gender

In several cultures, the term 'third gender' is variously applied to individuals who fall outside of the strict classification 'man' or 'woman'.

Some five million people in India, Pakistan and Bangladesh live as transgender. Known as *hijras* in India (picture below), all are now recognised as having legal identities on passports (indicated by the letter 'E' in Indian passports).

The *fa'afafine* of Samoa are biological males who adopt the traditional gender role of women and are known for their hard work in a domestic context and dedication to the family. Although fa'afafine may have sexual relations with non-fa'afafine men, they are not considered 'gay' as no such label exists in Samoa.

Question

Why might the fa'afafine role be considered different from typical notions of androgyny in the UK?



Do the hijras of India constitute a third gender?

Culture and gender roles

Cross-cultural research is noted for its valuable contribution to the **nature–nurture debate** in gender. For instance, if a particular **gender-role** behaviour appears to be *consistent* across different **cultures**, we might conclude that this represents an **innate**, biological difference between males and females. Conversely, if we find that some gender-role behaviours are *culturally specific* we might assume that the influence of shared norms and socialisation is decisive (as suggested by **social learning theory**).

Cultural differences (nurture)

One of the earliest cross-cultural studies of gender roles was carried out by Margaret Mead (1935) of cultural groups in Papua New Guinea:

- The Arapesh were gentle and responsive (similar to the stereotype of femininity in industrialised societies).
- The Mundugumor were aggressive and hostile (similar to the stereotype of masculinity in industrialised societies).
- The Tchambuli women were dominant and they organised village life, men were passive and considered to be 'decorative' (the reverse of the stereotype in industrialised societies).

This suggests that there may not be a direct biological relationship between sex and gender, and that gender roles may be culturally determined. In her later work, Mead conceded that she had underestimated the universal nature of many gender-typical behaviours. However, she went on to argue that the extent to which innate behaviours are expressed is largely the result of cultural norms.

Cultural similarities (nature)

It is also the case that there are many cross-cultural similarities in gender roles. For example, David Buss (1995) found consistent patterns in mate preference (a kind of gender role behaviour) in 37 countries across all continents. In all cultures, women sought men who could offer wealth and resources, whilst men looked for youth and physical attractiveness in a potential partner.

Also, a study by Robert Munroe and Ruth Munroe (1975) revealed that in most societies, division of labour is organised along gender lines (with men typically the 'breadwinners' and women often the 'nurturers').

Media and gender roles

The **media** provide **role models** with whom children may **identify** and want to **imitate**. As we have seen on the previous spread, children are likely to select **role models** who are the same gender as they are and who engage in stereotypically gender-appropriate behaviour (as this is more likely to be **reinforced**).

Rigid stereotypes

There is evidence that the media do provide very clear **gender stereotypes** that are quite rigid – men are independent, ambitious 'advice-givers', whereas women are depicted as dependent, unambitious 'advice-seekers' (Bussey and Bandura 1999). Similarly, a study of TV adverts by Adrian Furnham and Elena Farragher (2000) found that men were more likely to be shown in autonomous roles within professional contexts whereas women were often seen occupying familial roles within domestic settings. This suggests that the media may play a role in reinforcing widespread social stereotypes concerning gender-appropriate behaviour.

Self-efficacy

The media does more than confirm gender-typical behaviour, it may also give information to men and women in terms of the likely success, or otherwise, of adopting these behaviours. Seeing other people perform gender-appropriate behaviours increases a child's belief that they are capable of carrying out such behaviours in the future (what Bandura referred to as **self-efficacy**).

One study analysed the attitudes of people in India who had watched a programme designed to challenge deep-rooted gender stereotypes (Mitra *et al.* 2019). The programme (*Adha-full*) was a detective drama that ran for 78 episodes. Girls who watched the programme were more likely to see themselves as capable of working outside the home than non-viewers. This suggests their self-efficacy had changed as a result of media influence.

Evaluation

Research support

The influence of culture on changing gender roles is supported by evidence.

Geert Hofstede (2001) argues that in industrialised cultures the changing status and expectations of women are a function of their increasingly active role in the workplace and away from the domestic sphere. This has led to a breakdown of traditional stereotypes in advanced industrialised societies. In traditional societies women still occupy the role of house-maker as a result of social, cultural and religious pressures.

This suggests that gender roles are very much determined by cultural context.

Mead's research

One limitation is that Mead's cross-cultural research has since been criticised.

Mead has been accused of making generalisations based on a short period of study. Derek Freeman (1983) conducted a follow-up study of people from Papua New Guinea after Mead's investigation. He argued that Mead's findings were flawed as she had been misled by some of her participants, and that her preconceptions of what she would find had influenced her reading of events. This is an example of both **observer bias** and **ethnocentrism**.

This suggests that Mead's interpretations may not have been objective and calls into question the conclusions that she drew.

Evaluation eXtra

Nature or nurture?

Cross-cultural research makes a useful contribution to the nature–nurture debate. There is evidence of similarities in gender roles across cultures (e.g. Buss, Munroe and Munroe), suggesting that gender roles may be biologically-determined and the result of nature.

However, other research (e.g. Mead), supports the idea that gender roles are culturally relative and vary from society to society. This suggests the opposite – that gender norms are transmitted within cultures through processes of observation and imitation, i.e. nurture.

Consider: *In terms of gender roles, what conclusions can we draw about nature and nurture?*

Evaluation

Cultivation theory

One strength of research into media influence on gender roles is it has a theoretical basis.

Cultivation theory argues that the more time individuals spend 'living' in the media world, the more likely they are to believe that this reflects social reality. Bradley Bond and Kristin Drogos (2014) found a positive correlation between time spent watching the reality TV programme *Jersey Shore* and permissive attitudes towards casual sex. This effect was still found to be true when researchers controlled for the influence of such factors as existing sexual attitudes, parental attitudes and religious beliefs.

This suggests the media 'cultivates' perception of reality and this affects gender behaviour.

Passive recipients

One limitation of gender roles and the media is there may not be a causal relationship.

Kevin Durkin (1985) argues that even very young children are not passive and uncritical recipients of media messages. In fact, norms within the child's family may be the bigger determinant on the child's gender attitudes and behaviour. If media representations confirm existing gender norms held by the family then these are likely to be reinforced in the child's mind. If not, then such representations are likely to be rejected.

This suggests that media influences are secondary to other influences, such as family.

Evaluation eXtra

Counter-stereotypes

Evidence suggests that the media can play a positive role in challenging traditional gender stereotypes through counter-stereotypes (e.g. Disney move *Brave*). Suzanne Pingree (1978) found that gender stereotyping was reduced amongst school-age children when they were shown TV adverts featuring women in non-stereotypical roles.

However, in the same study, the stereotypes of older boys actually were stronger following exposure to the counter-stereotypes. Pingree attributed this 'backlash' to the boys' desire to differ from the adult view.

Consider: *What does this suggest about the success of counter-stereotypes?*

Apply it

Methods

Notel, Unitel and Multitel

In the 1970s a unique experiment was conducted in a town in British Colombia (Canada) that was about to receive a TV signal for the first time. Nicknamed 'Notel' by Tannis Williams and her team of researchers (1986), the town offered a rare opportunity to examine the effect of new media on the townsfolk.

The researchers carried out extensive surveys around the town to assess the behaviour and attitudes of the population prior to the introduction of television. They also collected similar data from two other neighbouring towns, 'Unitel' (that had access to one TV channel) and 'Multitel' (that had access to several). After a two-year period, all three towns were surveyed again.

Williams *et al.* noted how gender-stereotypical attitudes among the children of the three towns changed over two years. At the beginning of the study, children in Notel and Unitel displayed fewer gender-typed views and less evidence of gender stereotypical behaviour than their Multitel counterparts. At the end of the study, evidence of stereotypes on both of these measures had increased for the children of Notel.

Questions

1. What do the findings from this study suggest? (*2 marks*)
2. Outline *one* **sampling method** that could have been used to select participants in the study above. (*2 marks*)
3. Explain *one* limitation of the use of this method of sampling in the study above. (*3 marks*)
4. Explain *one* strength of the use of survey (**questionnaire**) data in the study above. (*3 marks*)



Are stars of the TV show *Jersey Shore* responsible for encouraging more permissive attitudes towards casual sex?

Check it

1. Outline how culture may influence gender roles. *[4 marks]*
2. Explain the influence of the media on gender roles. *[4 marks]*
3. Evaluate the influence of the media on gender roles. *[10 marks]*
4. Discuss research (theories and/or studies) into the influence of culture **and/or** media on gender roles. *[16 marks]*

Atypical gender development

The specification says...

Atypical gender development: gender dysphoria; biological and social explanations for gender dysphoria.

Some people experience a feeling of 'being trapped in the wrong body' when the gender they identify themselves as is not the same as their biological sex. This is referred to as gender dysphoria. On this spread, we explore the characteristics associated with this condition and the possible causes.

Key term

Gender dysphoria Used to describe when a person experiences discomfort or distress because there is a mismatch between their sex assigned at birth and their gender identity. This is also the clinical diagnosis for someone who doesn't feel comfortable with the sex they were assigned at birth (www.stonewall.org.uk).

Apply it
Concepts

The diagnostic criteria



In the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), a person is diagnosed with gender dysphoria (formerly gender identity disorder) if they experience psychological distress arising out of the mismatch between their expressed/experienced gender and the gender assigned to them at birth. This must continue for at least six months and cause significant impairment in social, occupational or other important areas of functioning. In children, the desire to be of the other gender must be present and verbalised.

Gender dysphoria is manifested in a variety of ways, including a strong desire to be treated as the other gender or to be rid of one's biological sex characteristics. This may also include a strong conviction that one has feelings and reactions typical of the other gender.

Question

The fact that gender dysphoria is included in DSM-5 means it is classed as a psychological disorder. To what extent do you think this view is justified? In your answer you might refer to your knowledge of the definitions of abnormality (covered in our Year 1 book).

Gender dysphoria

Some men and women experience a mismatch between their biological sex and the gender they feel that they are (their **gender identity**). Individuals who have **gender dysphoria** do not identify as their sex given at birth. For many people who experience this, gender dysphoria is a source of stress and discomfort and is thus recognised as a psychological disorder in **DSM-5** (see 'Apply it' below).

Biological explanations

In its categorisation of gender dysphoria, DSM-5 specifically excludes **intersex** conditions that have a recognised biological basis, such as **Klinefelter's syndrome** (see page 154) and **CAH** (see page 152). Nevertheless, it is plausible that gender dysphoria may be subject to some biological influence.

Brain sex theory

One biological explanation suggests that gender dysphoria has a basis in brain structure – the *bed nucleus of the stria terminalis* (BST). This structure is involved in emotional responses and also in male sexual behaviour in rats. This area is larger in men than women and has been found to be female-sized in transgender females (Kruijver *et al.* 2000).

This leads to the suggestion that people with gender dysphoria have a BST which is the size of the gender they identify with, not the size of their biological sex. This dimorphism in the BST (i.e. having two forms) fits with the report made by people who are transgender that they feel, from early childhood, that they were born the wrong sex (Zhou *et al.* 1995). In a follow-up study six transgender individuals showed an average BST neuron number in the female range (Kruijver *et al.* 2000).

Genetic factors

Frederick Coolidge *et al.* (2002) assessed 157 twin pairs (96 **MZ** and 61 **DZ**) for evidence of gender dysphoria. The researchers found that 62% of the variance could be accounted for by genetic factors. This suggests there is a strong heritable component to gender dysphoria.

Similarly, Gunter Heylens *et al.* (2012) compared 23 MZ twins with 21 DZ twins where one of each pair was diagnosed with gender dysphoria. They found that nine (39%) of the MZ twins were **concordant** for gender dysphoria compared to none of the DZs which would indicate a role for genetic factors in the development of gender dysphoria.

Social explanations

Social constructionism

The **social construction** perspective argues that gender identity does not reflect underlying biological differences between people and, instead, these concepts are 'invented' by societies. For individuals who experience gender dysphoria, the gender 'confusion' arises because society forces people to be either a man or a woman – they must 'pick a side' and act accordingly. From this perspective, gender dysphoria is not a pathological condition (as described within DSM) but a social phenomenon which arises when people are required to choose one of two particular paths.

Martha McClintock (2015) cites the case of individuals with a genetic condition (*5-alpha-reductase deficiency*) in the Sambia of New Guinea. This causes some biological males to be categorised as girls at birth because they have a labia and a clitoris. At puberty their genitals change because of the large increase in testosterone – testes descend and the clitoris enlarges into a penis. This genetic variation is common among the Sambia, and it was routinely accepted that some people are men, some women, and others are *kwolu-aatmwol* – females-then-males. Since this culture has had contact with other cultures however, kwolu-aatmwol are now judged as having a pathological form of gender dysphoria.

Psychoanalytic theory

Lionel Ovesey and Ethel Person (1973) emphasise social relationships within the family as the cause of gender dysphoria. They argue that gender dysphoria in biological males is caused by a boy experiencing extreme separation anxiety before gender identity has been established. The boy fantasises of a symbiotic fusion with his mother to relieve the anxiety, and the danger of separation is removed.

The consequence of this is that the boy, in a very real sense, becomes the mother and thus adopts a woman's gender identity. This theory has some support. Robert Stoller (1973) reports that, in interviews, GD biological males displayed overly close relationships with their mothers suggesting stronger female identification and thus conflicted gender identity in the long term.

Evaluation

Contradictory evidence

One limitation of brain sex theory is its central claims have been challenged.

Hillere Hulshoff Pol *et al.* (2006) studied changes in transgender individuals' brains using **MRI scans** taken during hormone treatment. The scans showed that size of the BST changed significantly over that period. In the studies by Kruijver *et al.* and Zhou *et al.* (facing page) the BST was examined **post-mortem** and after transgender individuals had received hormone treatment during gender reassignment treatment.

This suggests that differences in the BST may have been an effect of hormone therapy, rather than the cause of gender dysphoria.

Other brain differences

One strength is that evidence suggests there may be other brain differences associated with gender dysphoria.

Giuseppina Rametti *et al.* (2011) studied another sexually dimorphic aspect of the brain – that of white matter (the deeper tissues of the brain). There are regional differences in the proportion of white matter in male and female brains. Rametti *et al.* analysed the brains of both male and female transgender individuals, crucially *before* they began hormone treatment as part of gender reassignment. In most cases, the amount and distribution of white matter corresponded more closely to the gender the individuals identified themselves as being rather than their biological sex.

This suggests that there are early differences in the brains of transgender individuals.

Evaluation eXtra

Socially-sensitive research

For some individuals, knowing that there is a biological basis to their gender dysphoria may be a relief. Classifying GD as a medical category requiring treatment removes responsibility from the person. As a consequence, they may be less likely to assume the way they feel is 'their fault'.

However, others may object to the label of mental disorder being applied to gender dysphoria. Such a label risks stigmatising those who are subject to it, characterising them as 'ill' or 'sick' rather than merely 'different'.

Consider: *Is the label of a disorder helpful or damaging in relation to gender dysphoria?*

Evaluation

Social constructionism

One strength of the social constructionism approach is that not all cultures have two genders.

On the previous spread we saw how some cultures recognise more than two genders, such as the *fa'afafine* of Samoa. This is a challenge to traditional binary classifications of male and female. Indeed, the fact that increasing numbers of people now describe themselves as non-binary suggests that cultural understanding is only now beginning to 'catch up' with the lived experience of many.

This suggests that gender identity (and dysphoria) is best seen as a social construction rather than a biological fact.

Psychoanalytic theory

One limitation is there are issues with the psychoanalytic theory of gender dysphoria.

Ovesey and Person's explanation does not provide an adequate account of gender dysphoria in biological females as the theory only applies to transgender women (people assigned male at birth who identify as women). In any case, research by George Rekers (1986) found that gender dysphoria in those assigned male at birth is more likely to be associated with the absence of the father than the fear of separation from the mother.

This suggests that psychoanalytic theory does not provide a comprehensive account of gender dysphoria.

Evaluation eXtra

Different outcomes

Some people who experience gender dysphoria will decide to have gender reassignment surgery. With appropriate support, those individuals are able to reconcile their external appearance with the gender they have always identified as.

However, a significant proportion of people who experience dysphoria in childhood do not do so as adults. A study by Kelley Drummond *et al.* (2008) followed a sample of 25 girls who were all diagnosed with gender dysphoria in childhood. Only 12% (3 out of 25) were still classified as having gender dysphoria when they were followed up at 24 years old.

Consider: *Should gender reassignment surgery go ahead before the age of consent?*

Apply it Concepts — Zach Avery

Zach Avery is a boy who has insisted on wearing girls' clothes since the age of three. As their son became increasingly upset at being referred to as a boy, Zach's parents decided to seek the guidance of experts.

After months of consultations, doctors diagnosed Zach with gender dysphoria.

Zach became unrecognisable from the little boy he was a couple of years earlier, though his parents acknowledged that Zachy, as he became known at five years old, is happier than he ever was.

His primary school has supported the family, informing other pupils that Zachy felt he was a girl trapped in a boy's body and even converting some lavatories to gender-neutral.

Question

Explain why the case of Zach Avery contradicts Hulshoff *et al.*'s argument (above left).

Apply it Methods — Gender study

Researchers compared the size of the BST in 15 gender-typical individuals and 15 individuals with gender dysphoria. A significant difference was found between the two sets of data at the 0.01 level.

Questions

1. Which **statistical test** should the researchers have used to compare the difference in BST size in the investigation above? Justify your answer with reference to **levels of measurement**. (*3 marks*)
2. With reference to the investigation above, explain what is meant by 'a significant difference was found at the 0.01 level'. (*3 marks*)

Check it

1. Explain what is meant by 'gender dysphoria'. *[2 marks]*
2. Outline **one** biological explanation for gender dysphoria. *[4 marks]*
3. Briefly evaluate **one** social explanation for gender dysphoria. *[4 marks]*
4. Discuss biological **and/or** social explanations for gender dysphoria. *[16 marks]*

Practical corner

The specification says...

> Knowledge and understanding of ... research methods, practical research skills and maths skills. These should be developed through ... ethical practical research activities.

This means that you should conduct practical investigations wherever possible. On this spread there are two ideas for practical activities you might like to conduct, this time based on gender development research – a quasi-experiment to investigate whether there is a difference in ability to multitask and an opportunity to practise your observation skills by carrying out a content analysis of TV adverts to see if there is a difference in the way in which men and women are represented.

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?

How much could you remember?



Practical idea 1: Gender and multitasking

The aim of this study is to investigate whether there is a gender difference in multitasking, thus this is a **quasi-experiment** with an **independent variable** of gender.

In particular, we are interested to know whether men or women perform better in an experiment that tests *dichotic listening*. Dichotic listening (processing two different messages at once) may be a good indicator of whether someone is able to multitask.

The practical bit

There are many ways to define *multitasking* but one of these is the ability to attend to two or more messages at once – otherwise known as **dichotic listening**. There have been many experimental studies that have investigated people's ability to process simultaneous messages. These have generally concluded that – when listening to two pieces of information at the same time – our attentional system must 'filter out' one and prioritise the other. Although it is not possible to 'hear' both messages at the same time, it *is* possible to constantly switch our attention between the two so we can pick up some sense of what is going on. Do men or women (or neither) do this most effectively?

The task

You'll need a mate to carry out this investigation with – your co-researcher. Before you begin to recruit participants (most likely students) you will need to prepare two passages of information, both similar in length. These need to be long enough so they each cover 30–40 seconds worth of reading time (you might want to time yourself reading each passage to make sure it is the right length). The content of the two passages doesn't really matter, though you should avoid too many complicated words or technical terms. Your task is to read one of the passages into one of the participant's ears whilst your co-researcher reads their passage into the participant's other ear at the same time. The participant's task is to recall as much detail as they can from *both* passages by switching their attention between the two.

Measuring multitasking

Before they attempt the experimental task, participants should be told that they are being tested on their ability to switch attention between the two passages so they should try to recall as much information as they can from *both*. After hearing the passages read simultaneously, participants should divide a piece of paper into two halves and write down as much as they can remember from each passage on either side of the paper.

You then have the slightly laborious task of counting the number of words they successfully recall from each of the passages (the DV).

Pilot study

Before the full investigation begins you might want to practise a couple of times to make sure you and your co-researcher are reading at a similar sound level. As you have different voices, it will be impossible to match the tone and pitch of your voices exactly, but you should at least try to ensure that you are reading at the same steady pace and at a similar volume.

Choosing your sample

You will need to consider a suitable **sampling technique** for this investigation. If you're using students from your school or college, you might want to select participants from the same year group (as age might be a **confounding variable** within this experiment).

Apply it
Methods

The maths bit 1

Table 1 Median accuracy for recall of both passages and the range for men and women.

	Men	Women
Median	6.5	9
Range	4.5	3

1. Why are **measures of dispersion** calculated alongside **measures of central tendency** when analysing data? Refer to Table 1 in your answer. (*3 marks*)
2. Explain why the **median** is the most suitable measure of central tendency in this investigation. (*2 marks*)
3. Which graphical display would be most appropriate to represent the median accuracy of recall for men and women? Explain your answer. (*2 marks*)
4. Which **inferential test** would be most appropriate when calculating the difference in median accuracy of recall between men and women? Give *two* reasons for your answer. (*3 marks*)

Practical idea 2: Gender stereotyping in TV ads

The aim of this study is to see if there is evidence of gender stereotyping in TV advertisements.

This practical is based on the study by Furnham and Farragher (page 164) who investigated whether there are differences in the way men and women are portrayed in TV ads. Are these differences based on popular social stereotypes?

The practical bit

There is a considerable body of research that has investigated whether gender stereotyping is a feature of the **media**. Do TV programmes, books, films, magazines or adverts represent men and women in typically masculine and feminine ways? Or are such rigid **gender stereotypes** a thing of the past? Has today's society 'moved on' in this respect? Your task is to undertake a **content analysis** of TV adverts to investigate the **hypotheses** that men and women will be represented as occupying different roles, will advertise different products, and will be seen to have 'authority' in different contexts. You can either carry out this investigation with a friend (to increase the **reliability** of observations) or on your own.

Coding and categories

The processes involved in content analysis are discussed on page 64. As an observational technique, content analysis is flexible enough to produce both **qualitative** and **quantitative** data. However, it will probably make the data you collect more **objective** if the observations you make are **coded** using specific **behavioural categories**. But which categories should you use? The following are merely suggestions, you might want to incorporate these within your analysis or develop your own (though the first one, given the aim of the investigation, is probably essential!).

- The gender of the character.
- Whether the character is a 'product user' or 'product authority' (that is, an 'expert' giving information about the product/service).
- The character's 'role' (as a central or peripheral figure).
- The context (domestic, e.g. home/family environment or professional, e.g. at work).

It is predicted that men will be depicted in more central roles as product authorities in a professional context. Women, on the other hand, will be presented as product users in peripheral roles within domestic contexts.

Sampling adverts

How many adverts you sample is up to you but it might be an idea to spread your analysis across different times of the day. It is likely, for instance, that daytime adverts during the week may be 'targeted' more towards users of domestic products in the home. For this reason, a more representative sample will be gained from analysing at the weekend as well as during the week. Those researchers amongst you who are fortunate enough to have the ability to 'pause live TV' might be at an advantage as some adverts are quite complex and might require a second look!

Ethical issues

One of the great benefits of content analysis is that the usual **ethical issues** tend not to apply. As the adverts you are analysing are already in the public domain there is no need to ask for **informed consent** – you don't need permission to watch the telly! **Protection from harm**, **confidentiality** and **right to withdraw** can also be disregarded as there is no direct contact with the 'participants' (if we can call them that!) in your investigation.

Analysing data

Once you have collected your data don't forget to summarise it using appropriate graphs and charts.



A man using a product in a domestic location, but is that the norm in today's TV adverts?

Apply it
Methods

The maths bit 2

1. Explain how two researchers could have improved the **reliability** of their observation of TV adverts. (*3 marks*)
2. Explain *one* strength and *one* limitation of **content analysis**. Refer to this investigation in your answer. (*6 marks*)
3. What percentage of 'product users' were women in Table 2 below? (*2 marks*)
4. What fraction of characters represented in 'domestic' roles were men? (*2 marks*)
5. Explain *one* conclusion that can be drawn from the data in Table 2. (*2 marks*)

Table 2 Number of men and women in each behavioural category in TV adverts.

Gender of character	Product user	Product authority	Central	Peripheral	Domestic	Professional
Man	16	7	22	16	14	17
Woman	31	8	24	17	26	9



The maths bit

Overall, at least 10% of the marks in assessments for Psychology will require the use of mathematical skills and this is included in the requirement that at least 25–30% in total will involve research methods.

Revision summaries

Sex and gender

In psychology, sex and gender are different things.

Key concepts

Sex
Biological (nature), male or female, chromosomes (XX or XY), different hormones/anatomies.

Gender
Psychosocial (nurture), social/cultural norms.

Gender dysphoria
Biological sex and gender identity don't correspond.

Sex-role stereotyping
Expected behaviour of men and women in a given society. Some are based in reality (but no biological basis), others are sexist and damaging.

Androgyny

Young people are becoming increasingly androgynous in their behaviour and attitudes.

The theory

Defining androgyny
Possessing a balance of masculine and feminine traits.

Measuring androgyny: The BSRI
Respondents rate themselves for 60 masculine, feminine and neutral traits on a seven-point scale.
Classified as masculine, feminine, androgynous or undifferentiated.

Evaluation

Quantitative approach
Single score useful for dependent variable, but not representative of gender identity, combine BSRI with qualitative measure (e.g. PAQ).

Valid and reliable
1000 students tested, results corresponded with self-descriptions and good test-retest a month later.
Counterpoint – stereotypes of gender have changed over 40 years (low temporal validity), sample was American (low generalisability).

Self-awareness
People may lack insight into their gender identity (hypothetical construct), scale lacks objectivity.

Evaluation extra: Androgyny and well-being
Bem claimed androgyny is better for mental health but some claim masculine traits are more desirable (Adams and Sherer).

The role of chromosomes and hormones

Biologists see sex and gender as one and the same.

Explanations

The role of chromosomes
XX for females, XY for males.
Y chromosome has SRY gene (androgens).

The role of hormones
Prenatal effect on brain and genitals. Burst of activity at puberty.

Testosterone
Male prenatal development, aggression (adaptive for males e.g. mate competition).

Oestrogen
Female development, menstruation, premenstrual syndrome (PMS), emotionality.

Oxytocin
The 'love hormone', released in large quantities during labour. Reduces cortisol.

Evaluation

Evidence for testosterone
Powerful effect on male sexual behaviour in hypogonadal men (Wang *et al.*).
Counterpoint – extra testosterone had no effect on sexual or aggressive behaviour in normal adult males (O'Connor *et al.*).

Social factors ignored
Individualist cultures show more masculine traits and value them more (Hofstede *et al.*).

Reductionist
Biological explanations ignore schema (cognitive) and conflict (psychodynamic).

Evaluation extra: Pathologising gender
PMS diagnosis means access to treatment, but some see it as a damaging social construction (Rodin).

Atypical sex chromosome patterns

Not everyone conforms to the XX XY chromosomal pattern.

Explanations

Klinefelter's syndrome
XXY chromosomal structure (biological male), 1 in 600 males, many unaware.
Physical characteristics – reduced body hair, some breast development, rounded body contours, clumsiness.
Psychological characteristics – poor language and problem-solving, shyness, lack interest in sex.

Turner's syndrome
XO chromosomal structure (biological female), 1 in 5000.
Physical characteristics – infertility, webbed neck, shield chest, narrow hips.
Psychological characteristics – high reading ability, reduced spatial memory, social immaturity.

Evaluation

Nature–nurture debate
Behavioural differences may indicate biological basis for gender.
Counterpoint – differences may be due to social influences e.g. Turner's individuals look immature so treated immaturely.

Real-world application
Early diagnosis means more able to manage condition in the future (Herlihy *et al.*).

Sampling issue
Prospective studies show fewer cognitive and psychological problems (Boada *et al.*).

Evaluation extra: Knowing or not knowing
Knowing you have KS or TS creates self-fulfilling prophecy, however early diagnosis means access to support.

Cognitive explanations of gender development

Kohlberg's theory

Maturation explains why a child moves from one stage to the next.

The theory

Stages in development
Driven by maturation of the brain, similar to Piaget.

Stage 1: Gender identity
Child can label own and others' gender correctly.

Stage 2: Gender stability
Child understands they will always stay the same gender, confused by e.g. men with long hair.

Stage 3: Gender constancy
Gender stays the same across time and situations.
Children imitate role models and show gender stereotyping.

Evaluation

Research support
Can George play with dolls? 4-year-olds said OK, 6-year-olds, not OK (Damon).
Counterpoint – children absorb gender-appropriate behaviour at gender identity stage (Bussey and Bandura).

Methodological problem
Children aged 3–5 show constancy if first see child with no clothes, then stereotypically gender-inappropriate clothing doesn't fool them (Bem).

Degrees of constancy
First degree before 6 (seeking gender information), second degree later (Martin *et al.*).

Evaluation extra: Nature or nurture?
Cross-cultural similarity supports biological influence (Munroe *et al.*), but socialisation processes also important (Bussey and Bandura).

Gender schema theory

Schema generate expectations about gender behaviour.

The theory

Gender schema theory (GST)
Cognitive-developmental, children actively structure experience.

Gender schema after gender identity
A generalised representation of everything we know in relation to gender (schema), starts soon after gender identity.

Gender schema determine behaviour
Schema formed around stereotypes and direct behaviour by age 6.

Ingroup information better remembered
Better understanding of ingroup schema, but by age 8 children have schema for both genders.

Evaluation

Research support
Memory worse for stereotypically gender-inappropriate pictures and changed gender when recalling (Martin and Halverson).

Earlier gender identity
Children label themselves as a 'boy' or 'girl' at 19 months, earlier than predicted (Zosuls *et al.*).
Counterpoint – GST ages are averages not absolutes, sequence of stages more important.

Cultural differences
Gender schema explain cultural differences in gender schema and acquisition of more fluid gender concepts (Cherry).

Evaluation extra: Timing
Kohlberg claims children achieve constancy then imitate gender behaviour, Martin and Halverson claim it happens as soon as gender identity develops.

Other explanations of gender development

Psychodynamic

Developments in the phallic stage.

Freud's psychoanalytic theory

Pre-phallic children
Five psychosexual stages, 3rd one is phallic stage (age 3–6). Pre-phallic children do not distinguish between men and women, no gender identity.

Oedipus complex
Phallic stage in boys, desire for mother, jealous hatred of father, castration anxiety.
Resolved through identification with father.

Electra complex
Girls experience penis envy, mother is a love rival and blamed for lack of penis.
Resolved through the desire to have children which drives identification with the mother (Jung).

Identification and internalisation
Identification leads to internalisation of same-gender parent's identity. Happens all at once.

Little Hans
Freud's evidence for the Oedipus complex.
Hans feared horses and feared his father would castrate him – displaced onto horses.

Evaluation

The Oedipus complex
75% of 'gender disturbed' boys did not have a biological/substitute father (Rekers and Morey).
Counterpoint – research on children from lesbian parents and 'traditional' families, no difference in gender identity (Bos and Sandfort).

Female development
Freud's account reflected men's power in Victorian times (androcentric bias), men may have 'womb envy' (Horney).

Pseudoscientific
Methods (e.g. case studies) lack rigour, concepts (e.g. penis envy) untestable, so cannot be falsified.

Evaluation extra: The nature of development
Freud and Kohlberg agree that gender-appropriate behaviour starts at 6, however, Kohlberg sees a gradual sequence whereas for Freud it is all at once.

Social learning

Children acquire gender concepts through differential reinforcement.

The theory

Social learning theory (SLT)
Gender behaviours learned in a social context.

Direct reinforcement
Children repeat gender behaviours that are rewarded and avoid those that are punished = differential reinforcement.

Indirect (vicarious) reinforcement
Children observe consequences of gender behaviour, imitate those with favourable outcome, avoid those that are punished.

Identification and modelling
The child attaches to role models (identifies) and imitates (models) behaviour, especially same-gender models.

Mediational processes
Learning of gender-role behaviour is influenced by attention, retention, motivation and motor reproduction.

Evaluation

Research support
Differential reinforcement – babies dressed as boys or girls given gender-related toys (Smith and Lloyd).
Counterpoint – differential reinforcement not always the cause, adults reinforce to pre-existing differences in boys and girls (e.g. boys being innately more active).

Cultural changes
Androgyny more common now in many cultures, can be explained by less 'punishment' and more reinforcement (SLT not biology).

No developmental sequence
Not reflected in SLT where learning is the same at any age, conflicts with e.g. Kohlberg.

Evaluation extra: Identification
Is the key influence on gender identity the same-gender parent (Freud), or other key influences e.g. siblings, peers, media (SLT)?

The influence of culture and media on gender roles

Two key ways in which social norms of gender are communicated.

Culture

Consistent behaviours across cultures = nature, differences = nurture.

Cultural differences (nurture)
Mead studies in Papua New Guinea (Arapesh, Mundugumor, Tchambuli), gender roles culturally rather than biologically determined.

Cultural similarities (nature)
Consistencies in mate preference across 37 cultures (Buss).
In most societies division of labour is gendered (Munroe and Munroe).

Evaluation

Research support
Women's role has changed in industrialised societies as they have moved into workplace, not in traditional societies (Hofstede).

Mead's research
Freeman studied people from Papua New Guinea, concluding Mead had been misled (observer bias and ethnocentrism).

Evaluation extra: Nature or nurture?
Evidence of similarities in gender roles (e.g. Buss) = nature, but also evidence of cultural relativism (e.g. Mead) = nurture.

Media

Children most likely to imitate same-sex models performing gender-appropriate behaviours.

Rigid stereotypes
The media promotes stereotypes.
Men independent, women dependent (Bussey and Bandura).
Men autonomous and professional, women in domestic, family roles (Furham and Farragher).

Self-efficacy
Media influences what gender behaviour children believe they are capable of.
Girls in India who watched a programme challenging gender stereotypes more likely to see themselves working outside the home (Mitra *et al.*).

Evaluation

Cultivation theory
Jersey Shore viewers more permissive attitudes to sex than non-viewers, media 'cultivates' perceptions of reality (Bond and Drogos).

Passive recipients
Children only accept gender representations if they fit family norms (Durkin).

Evaluation extra: Counter-stereotypes
Gender stereotyping reduced when children shown counter-stereotypes of women, but became stronger in pre-adolescent boys (Pingree).

Atypical gender development

Biological and social explanations of gender dysphoria (GD).

Biological explanations

Brain sex theory
GD related to brain structure – at birth BST female-sized in transgender females (Kruijver *et al.*).

Genetic factors
Twin studies show 62% of variance accounted for by genetic factors (Coolidge *et al.*), 39% of MZ twins concordant for gender (Heylens *et al.*).

Evaluation

Contradictory evidence
BST differences may be effect of hormone therapy not cause of GD (Hulshoff Pol *et al.*), other research was after hormone therapy.

Other brain differences
Amount of white matter in childhood in GD individuals corresponded to sex they identified as (Rametti *et al.*).

Evaluation extra: Socially-sensitive research
GD as medical category means people feel it's not 'their fault', however stigmatises people as 'sick' so social understanding is vital.

Social explanations

Social constructionism
Gender identity 'invented' by societies, gender confusion because forced to select a gender, social not pathological.

Psychoanalytic theory
Male gender dysphoria due to extreme separation anxiety, symbiotic fusion and desire to be his mother (Ovesey and Person)

Evaluation

Social constructionism
Cultures recognise more than two genders e.g. fa'afafine and current non-binary gender in our culture.

Psychoanalytic theory
GD in those assigned male at birth more likely associated with absence of father than fear of separation from mother (Rekers).

Evaluation extra: Different outcomes
Some people with GD have gender reassignment surgery, but one study found only 12% of GD girls were still GD at 24 years old (Drummond *et al.*).

Practice questions, answers and feedback

Question 1 Using an example, define 'androgyny'. (*2 marks*)	
Morticia's answer *Androgyny refers to when a person is both male and female, for example, Bem's idea about androgyny.*	Nothing of value in Morticia's answer – the key idea of a 'balance' between masculine and feminine traits is not conveyed and the example is vague. Luke's answer contains both elements and is clear (full credit) whereas Vladimir's example is not really an example and reads more like a repeat of the definition.
Luke's answer *Bem suggested that it was healthy to have a mixture of masculine and feminine characteristics, for example, be assertive and affectionate.*	
Vladimir's answer *Male and female behaviour mixed together rather than having to be just one or the other. An example would be someone who has both male and female characteristics.*	

Question 2 Outline **one** way in which androgyny might be measured. (*2 marks*)	
Morticia's answer *It can be measured using Bem's scale. This consists of a list of male and female characteristics and you tick the ones that apply to you.*	Interesting to see three very different answers here. Morticia's represents the 'bare minimum' for this answer but she has identified an appropriate scale and provided a (limited) outline. Luke's answer is the most sophisticated, and Vladimir has also provided a sufficiently thorough answer.
Luke's answer *The BSRI is used to measure androgyny by getting people to rate 60 characteristics on a scale of 1 to 7. You then add the scores up to see whether you are more feminine than masculine.*	
Vladimir's answer *Bem selected a list of 20 feminine and 20 masculine characteristics and then asked people to rate how much each was like them.*	

Bryan is 3 years old. When his nursery teacher asks him what he will be when he grows up, Bryan replies, 'I will be a mummy'.
Ryan is 5. When his mum tells him that daddy has a new job as a nurse, Ryan is shocked. 'Does that mean daddy is a lady now?' asks Ryan.

Question 3 (a) What is meant by 'gender stability'? Refer to the comment made by Bryan as part of your answer. (*2 marks*)
(b) What is meant by 'gender constancy'? Refer to the comment made by Ryan as part of your answer. (*2 marks*)

Morticia's answer *(a) Bryan is an example of gender stability because he thinks his gender will change when he gets older.* *(b) Ryan is in a stage of gender constancy because he doesn't think a man can change to a woman.*	Unfortunately no credit for Morticia. She has not provided an outline for either term and, because of this, her attempted application points are not adequate. In the first part, she has not recognised that Bryan has not yet reached stability given his answer.
Luke's answer *(a) Gender stability is the second stage around the age of 4 so we would expect Bryan to be at that stage. At the stage of stability a child should recognise that gender is consistent over time but Bryan clearly doesn't recognise this because he thinks he may change gender when he's older.* *(b) Gender constancy is when a child recognises gender is stable over time and situations, which is usually achieved by age 7. Ryan has not achieved this yet because he thinks that his father will change gender because of having a different job.*	The first sentence in (a) is inaccurate (Bryan is 3) but the rest of the answer is strong which compensates for the inaccuracy. Part (b) is also very good – there is a clear definition of the term followed by appropriate application.
Vladimir's answer *(a) Kohlberg said there were three stages of development. Gender identity is first and that's the stage Bryan is in because he is just 3. When he gets to the next stage, gender stability, he will realise that gender can't change like this but he still thinks it's changeable.* *(b) Ryan is 5 so he is probably in the gender stability stage. When he reaches gender constancy he will realise gender can't change at all. It isn't just about appearance. At the moment he thinks that nursing is just for women and his father would have to become a woman to be a nurse.*	In part (a) most of Vladimir's answer is focused on gender identity but there is a brief outline of stability in the last sentence. In part (b) there is the opposite problem this time: Vladimir's application to the stem is OK but the outline of constancy that precedes it is weak.

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

Question 4 Discuss Freud's psychoanalytic theory of gender development. (*16 marks*)

Luke's answer *Sigmund Freud wrote one of the most important theories in psychology, his theory of personality called psychoanalysis. This is the basis of the psychodynamic approach in psychology. This approach believes that we are driven by unconscious thoughts that have been repressed there because of conflicts. One of those conflicts comes from early gender development. In his theory of psychoanalysis, Freud explained how a little boy or girl comes to think of their gender. He called this the Oedipus and Electra complexes. In the Oedipus complex, a little boy starts off by falling in love with his mother. (The word Oedipus is named after a Greek myth of a man who married his mother without realising it.) When the boy starts to love his mother he resents his father because his father is a rival. In fact he starts to wish his father was dead. This makes him feel guilty and scared because he thinks his father may castrate him because he is a bad boy. Eventually the boy comes to resolve his feelings by identifying with his father and through this identification the boy learns about being a boy and man. Freud supported this theory with his case study of Little Hans who went through just these experiences. He loved his mother and wished his father was dead but eventually identified with his father. However, one case study like this is not really enough to support a theory. The case study was also subjective and biased and we can't generalise from a case study that may be unique. There isn't any other research to support it.*

Freud described a similar process in girls but it was less strong. A girl resents her mother because she hasn't got a penis and she envies the fact that her father has one (penis envy). Eventually she realises she can have babies instead and comes to identify with her mother. There is even less evidence to support this and some people say that Freud was confused between penis envy and really an envy of male power. So his theory is gender-biased because he doesn't really represent women very well.

Freud's ideas rely on the fact that children have two parents but many children don't grow up with both a mother and father so how does their gender develop? There is evidence that they develop perfectly well so gender development can't be related to identification with one parent. It is a very biased theory because it ignores one-parent families or homosexual parents. In Freud's defence he did write the theory a long time ago and things were very different. **(434 words)**

Luke's answer demonstrates a common flaw in essay answers on this topic – there is very little focus on gender *development*. As a generic description of the Oedipus complex this is accurate, though much too detailed. Unfortunately though, Luke fails to link the key concepts he describes to the *development* of gender.

The evaluation of Freud's case study method lacks similar focus. It is only in the last paragraph that Luke begins to include reference to gender.

A disappointing answer that has far too little evaluation – and far too much description. This is not the appropriate balance for an extended writing question where there should be almost twice as much evaluation.

Vladimir's answer *Freud identified five stages of psychosexual development. The third stage is the phallic stage. Before this stage (before the age of about 4) children have no gender identity but around the age of 4 they become interested in their genitals and experience the Oedipus or Electra complex. Little boys develop a desire for their mother and a hatred for their father who stands in their way. The boy fears that his father may find out and experiences castration anxiety. To resolve the conflict, the boy gives up his love for his mother and begins to identify with his father.*

Little girls at the same age experience penis envy, seeing themselves and their mother as being in competition for their father's love. Girls eventually accept that they will never have a penis and substitute penis envy for the desire to have children, identifying with their mothers as a result.

Central to this account are the concepts of identification and internalisation. Gender identity is achieved when a child identifies with the same-gender parent and then begins to internalise the parent's gender concepts.

There is very little evidence to support either account of gender development. One of the only things is the case study of Little Hans who experienced the Oedipus complex but this is quite subjective and only one individual so we can't really generalise this. It also occurred a long time ago and may not apply today.

There is also some evidence from a study where boys were interviewed (Rekers and Morey) about their gender. It was found that the boys who were judged as gender disturbed were more likely not to have a biological father or substitute father. This is what we would expect from Freud's theory because he predicted that without a father a boy has no opportunity to resolve the Oedipus conflict.

However other research is less supportive and really criticises Freud's suggestion that a father is necessary for normal gender development. For example there don't seem to be issues with gender identity development in non-traditional families. For example where there are lesbian parents gender identity in boys seems fairly normal. So again there is no father but boys seem to be fairly well-adjusted and have no problems with their own gender identity (Bos and Sandfort).

People are even more critical about Freud's description of female gender development. For example, Karen Horney argued that men might equally experience womb envy and that in fact both womb envy and penis envy are cultural concepts, which therefore may not apply beyond the European 19th century where Freud lived. Freud's views were androcentric as he viewed development from a male perspective, suggesting female development was inferior.

In general, Freud has been accused of producing pseudoscientific theories because his concepts were basically untestable and in this sense his theory isn't really a theory at all because it cannot be falsified. **(478 words)**

Compare Luke's description of the theory to Vladimir's here. This is a much more concise account that is clearly focused on gender *development* throughout. Oedipus and Electra complexes are well-used here, rather than being long and rambling.

Perhaps the case study of Little Hans could have been more clearly linked to gender development but is still relevant.

Paragraph 5 presents some further evidence to support the psychodynamic approach of gender development and this point is better developed – elaboration is a very important skill when presenting evaluation.

In paragraph 6 evidence is used effectively as counterargument. This is followed by a well-constructed and well-informed critical point in the penultimate paragraph – the same point as Luke made is much better elaborated and includes relevant evidence.

Some paragraphs may look short but the points are each reasonably elaborated and certainly contextualised.

Multiple-choice questions

Sex and gender

1. The term 'sex' refers to a person's:
   (a) Psychological status as male or female.
   (b) Cultural status as a man or woman.
   (c) Biological status as male or female.
   (d) Marital status as husband or wife.

2. A 'sex-role stereotype' is:
   (a) A set of beliefs and preconceived ideas about what is expected or appropriate for men and women.
   (b) A person's psychosocial status as a man or woman.
   (c) A person's biological status as male or female.
   (d) A person who has a balance of masculine and feminine traits.

3. A mismatch between a person's sex and the gender they feel they are:
   (a) Gender dysphoria.
   (b) Gender dystopia.
   (c) Gender distemper.
   (d) Gender dyslexia

4. Parents and the media are examples of:
   (a) Sex-role stereotypes.
   (b) Gender tutors.
   (c) Agents of socialisation.
   (d) Social researchers.

Androgyny

1. Which of the following is the definition of androgyny?
   (a) A person who is gender-neutral.
   (b) A person who has ambiguous genitalia at birth.
   (c) A person who is neither male nor female.
   (d) A person who has a balance of masculine and feminine traits.

2. What does BSRI stand for?
   (a) The Bem Sex Role Inventory.
   (b) The Bem Sex Rating Index.
   (c) The Bem Social Role Items.
   (d) The Bem Sausage Roll Incident.

3. High levels of androgyny are associated with:
   (a) Psychological well-being.
   (b) Psychological disorder.
   (c) Psychological trauma.
   (d) Psychological boredom.

4. Gender identity is difficult to measure using questionnaires as it is a:
   (a) Hybrid contrast.
   (b) Hypothetical conflict.
   (c) Hyperactive concept.
   (d) Hypothetical construct.

The role of chromosomes and hormones

1. Which hormone is *not* associated with sex and gender?
   (a) Adrenaline.
   (b) Oxytocin.
   (c) Testosterone.
   (d) Oestrogen.

2. Sex is determined by which pair of chromosomes?
   (a) 21st.
   (b) 22nd.
   (c) 23rd.
   (d) 24th.

3. O'Connor *et al*. found that men who were given increased testosterone showed:
   (a) Increased sexual activity.
   (b) No change in aggression.
   (c) Increased aggression.
   (d) Changes in body shape.

4. Which is the correct chromosomal structure for males and females?
   (a) XY YX
   (b) XY YY
   (c) XX YY
   (d) XY XX

Atypical sex chromosome patterns

1. Which *one* of the following is *not* associated with Turner's syndrome?
   (a) XO chromosomal structure.
   (b) Webbed neck.
   (c) Clumsiness.
   (d) Lower-than-average visual memory.

2. Which one of the following is *not* associated with Klinefelter's syndrome?
   (a) XYY chromosomal structure.
   (b) Reduced body hair.
   (c) Rounding of body contours.
   (d) Poor reading ability.

3. Approximately how many females have Turner's syndrome?
   (a) 1 in 50.
   (b) 1 in 500.
   (c) 1 in 5000.
   (d) 1 in 50,000.

4. Which of the following might individuals with Klinefelter's benefit from?
   (a) Testosterone injections.
   (b) Oestrogen injections.
   (c) Progesterone injections.
   (d) There is no known treatment for Klinefelter's.

Cognitive explanations of gender development: Kohlberg's theory

1. Which is the odd one out?
   (a) Gender identity.
   (b) Gender schema.
   (c) Gender stability.
   (d) Gender constancy.

2. Children in the gender identity stage:
   (a) Understand that they will stay the same gender for the rest of their life.
   (b) Understand that other people will stay the same gender for the rest of their lives.
   (c) Can label themselves as a boy or girl.
   (d) Understand that sex stays the same irrespective of appearance or context.

3. According to Piaget, children in gender constancy are no longer:
   (a) Egotistic.
   (b) Ego idealistic.
   (c) Egocentric.
   (d) Egomaniacal.

4. At which stage do children begin to seek out gender-appropriate role models to imitate?
   (a) Gender schema.
   (b) Gender stability.
   (c) Gender constancy.
   (d) Gender identity.

Cognitive explanations of gender development: Gender schema theory

1. The concept of schema comes from which approach?
   (a) Cognitive.
   (b) Behaviourist.
   (c) Biological.
   (d) Social learning.

2. Which of the following is correct in relation to the Martin and Halverson study?
   (a) Children recalled information that was inconsistent with their gender schema.
   (b) Boys recalled more inconsistent information than girls.
   (c) Children recalled information that was consistent with their gender schema.
   (d) The children did not recall any information.

3. At what age are children thought to develop elaborate schema for *both* genders?
   (a) 2.
   (b) 4.
   (c) 6.
   (d) 8.

4. Zosuls *et al*. found that gender identity developed at:
   (a) 19 months.
   (b) 21 months.
   (c) 24 months.
   (d) 36 months.

Other explanations of gender development: Psychodynamic

1. At which stage is the acquisition of gender identity thought to occur?
   (a) Oral.
   (b) Anal.
   (c) Phallic.
   (d) Genital.

2. Which other explanation of gender uses the term *identification*?
   (a) Biological.
   (b) Social learning theory.
   (c) Cognitive schema.
   (d) Humanistic.

3. What do girls experience during the Electra complex?
   (a) Penis envy.
   (b) Parent envy.
   (c) Womb envy.
   (d) Castration anxiety.

4. What evidence did Freud use to illustrate the Oedipus complex?
   (a) Little Anne.
   (b) Little Hans.
   (c) Little Heinz.
   (d) Little Horse.

Other explanations of gender development: Social learning

1. Seeing someone else being rewarded for gender-appropriate behaviour is known as?
   (a) Direct reinforcement.
   (b) Virtual reinforcement.
   (c) Differential reinforcement.
   (d) Vicarious reinforcement.

2. 'The process whereby a child attaches himself or herself to a person who is seen to possess qualities that the child regards as rewarding' is:
   (a) Identification.
   (b) Imitation.
   (c) Internalisation.
   (d) Modelling.

3. Which of the following is a strength of social learning theory?
   (a) It offers a developmental theory of gender development.
   (b) It places no emphasis on the role of genes and hormones on behaviour.
   (c) It acknowledges the role of the unconscious in gender development.
   (d) It can explain the changing nature of gender roles in many societies.

4. Which of the following would *not* be a characteristic associated with a role model?
   (a) Attractive.
   (b) High status.
   (c) Different gender from the child.
   (d) Same gender as the child.

The influence of culture and media on gender roles

1. Cultural differences in gender behaviour would best support:
   (a) Social learning theory.
   (b) Biological theory.
   (c) Psychoanalytic theory.
   (d) Cognitive theory.

2. Which of these was *not* a South Pacific cultural group studied by Mead?
   (a) Arapesh.
   (b) Mundugumor.
   (c) Hijra.
   (d) Tchambuli.

3. In Bussey and Bandura's study women were often seen to be:
   (a) Independent, ambitious advice-givers.
   (b) Dependent, unambitious advice-seekers.
   (c) Insensitive, aggressive advice-takers.
   (d) Sensitive, non-aggressive advice-offerers.

4. Girls in which country experienced increased self-efficacy when watching counter-stereotypes?
   (a) India.
   (b) Ireland.
   (c) Iceland.
   (d) Israel.

Atypical gender development

1. Gender dysphoria:
   (a) Can affect both men and women.
   (b) Only affects men.
   (c) Only affects women.
   (d) Affects neither men nor women.

2. The part of the brain known as the BST is normally:
   (a) Larger in males.
   (b) Larger in females.
   (c) The same size in males and females.
   (d) Not present in males or females.

3. Heylens *et al.* found what percentage of MZ twins were concordant for gender dysphoria?
   (a) 29%.
   (b) 39%.
   (c) 49%.
   (d) 59%.

4. A problem with the research by Zhou *et al.* is that they studied the individuals:
   (a) Before gender reassignment.
   (b) After gender reassignment.
   (c) Before hormone treatment.
   (d) After hormone treatment.

MCQ answers

Sex and gender 1C, 2A, 3A, 4C
Androgyny 1D, 2A, 3A, 4D
The role of chromosomes and hormones in sex and gender 1A, 2C, 3B, 4D
Atypical sex chromosome patterns 1C, 2A, 3C, 4A
Cognitive explanations of gender development: Kohlberg's theory 1B, 2C, 3C, 4C
Cognitive explanations of gender development: Gender schema theory 1A, 2C, 3D, 4A
Other explanations of gender development: Psychodynamic 1C, 2B, 3A, 4B
Other explanations of gender development: Social learning 1D, 2A, 3D, 4C
The influence of culture and media on gender roles 1A, 2C, 3B, 4A
Atypical gender development 1A, 2A, 3B, 4D

Chapter 7 Cognition and development



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When discussing autism, the language we use is important. The prevailing approach now is to take what is called the 'identity first' approach and say 'an autistic person' (instead of 'a person with autism'). This is preferred by both the National Autistic Society and Autistic UK, as explained on the Identity First Autistic website:

'As autistic people, we see our neurology as an integral part of who we are – not a separate or negative add-on. We are proud to be called autistic and believe autism-positive language promotes equality and acceptance. Identity-first language tells society that we should be respected along with our differences, not in spite of them.'

Piaget's theory of cognitive development

The specification says...

Piaget's theory of cognitive development: schema, assimilation, accommodation, equilibration.

This spread is concerned with Jean Piaget's approach to understanding the processes of learning. Piaget was concerned with both what *motivates* us to learn and *how* our knowledge of the world develops.

Key terms

Cognitive development A general term describing the development of all mental processes, in particular thinking, reasoning and our understanding of the world. Cognitive development continues throughout the lifespan but psychologists have been particularly concerned with how thinking and reasoning develops through childhood.

Schema A mental framework of beliefs and expectations that influence cognitive processing. They are developed from experience.

Assimilation A form of learning that takes place when we acquire new information or a more advanced understanding of an object, person or idea. When new information does not radically change our understanding of the topic we can incorporate (assimilate) it into an existing schema.

Accommodation A form of learning that takes place when we acquire new information that changes our understanding of a topic to the extent that we need to form one or more new schema and/or radically change existing schema in order to deal with the new understanding.

Equilibration Takes place when we have encountered new information and built it into our understanding of a topic, either by assimilating it into an existing schema or accommodating it by forming a new one. Once assimilation or accommodation has taken place, everything is again balanced and we have escaped the unpleasant experience of a lack of balance – disequilibrium.

Cognitive development

The term 'cognitive' refers to our mental processes. These include perception, language, memory and thinking, so the term 'cognitive development' refers to the ways in which all these processes change and develop throughout the human lifespan. Much of the research in cognitive development has concerned the development of thinking and reasoning in children. In this chapter we are particularly interested in the development of children's reasoning and their understanding of social situations and what is happening in the minds of others.

Piaget's theory of cognitive development

Jean Piaget (1926, 1950) produced an influential theory of **cognitive development**. Piaget's great contribution to child psychology was to realise that children do not simply know less than adults do. Instead Piaget realised that children think in entirely different ways from adults.

Based on this understanding, Piaget divided childhood into stages, each of which represents the development of new ways of reasoning (these are explained on the next spread). Piaget also looked at children's learning, in particular at two aspects: the role of *motivation* in development and the question of *how* knowledge develops. We begin with a look at **schema**.

Schema

The world is represented in the mind of the individual. As children develop they construct more and more detailed and complex mental representations of the world. These representations are stored in the form of schema.

According to Piaget, children are born with a small number of schema, just enough to allow them to interact with the world and other people. Right from the beginning, in infancy, we construct new schema. One of these is the 'me-schema' in which all the child's knowledge about themselves is stored. Cognitive development involves the construction of progressively more detailed schema for people (including ourselves) and also for objects, physical actions and, later, more abstract ideas like justice and morality.

The *motivation* to learn: Disequilibrium and equilibration

A key element of Piaget's theory is the motivation to learn. According to Piaget, we are pushed to learn when our existing schema do not allow us to make sense of something new. This leads to the unpleasant sensation of *disequilibrium*. To escape disequilibrium we have to adapt to the new situation by exploring and developing our understanding. By doing this we achieve **equilibration**, the preferred mental state.

How learning takes place: Assimilation and accommodation

Piaget saw the process of learning as adapting to the new situation so that we understand it. He identified two processes by which this adaptation takes place. **Assimilation** takes place when we understand a new experience and equilibrate by adding new information to our existing schema. For example, a child in a family with dogs can adapt to the existence of different dog breeds by assimilating them into their dog schema.

Accommodation takes place in response to dramatically new experiences. The child has to adjust to these by either radically changing current schema or forming new ones. So a child with a pet dog may at first think of cats as dogs (because they have four legs, fur and a tail) but then recognise the existence of a separate category called cats. This accommodation will involve forming a new 'cat-schema'.



A child may initially try to assimilate their cat into an existing 'dog schema' but will eventually form a new 'cat schema' to accommodate the existence of cats.

Apply it

Concepts

Schema at the zoo

At the age of four years Paige is visiting the zoo for the first time. She has enjoyed feeding ducks and pigeons in her local park before but this is the first time she has learned about the existence of parrots and bats.

Question

Referring to Piaget's theory, explain the processes of learning Paige might go through when she sees parrots and bats and asks questions about them in order to understand what they are.

Evaluation

Research support

One strength of Piaget's theory is the existence of evidence for the individual formation of mental representations.

Piaget's theory of learning suggests that children will form quite individual representations of the world, even when they have similar learning experiences. Christine Howe *et al.* (1992) demonstrated this in a study in which children aged 9–12 years were placed in groups of four to investigate and discuss the movement of objects down a slope. Following this activity all the children were found to have increased their understanding. Crucially though, their understanding had *not* become more similar. Instead each child had picked up different facts and reached slightly different conclusions.

This means that each child had formed an individual mental representation of how objects move on slopes – as Piaget would have expected.

Real-world application

A further strength of Piaget's theory is that it has been applied in teaching.

Piaget's idea that children learn by actively exploring their environment and forming their own mental representation of the world has changed classroom teaching. Since Piaget's ideas became popular in the 1960s, the old-fashioned classroom, in which children sat silently in rows copying from the board, has been replaced by activity-oriented classrooms in which children actively engage in tasks that allow them to construct their own understandings of the curriculum. Such *discovery learning* can take different forms. In the Early Years classroom children may, for example, investigate the physical properties of sand and water. At A level, discovery may take the form of 'flipped' lessons where students read up on the content, forming their own basic mental representation of the topic prior to the lesson.

This shows how Piaget-inspired approaches may facilitate the development of individual mental representations of the world.

Counterpoint Piaget's theory has certainly influenced modern practice in teaching and learning. However, there is no firm evidence showing that children learn better using discovery learning. In a recent review Ard Lazonder and Ruth Harmsen (2016) concluded that discovery learning *with considerable input from teachers* was the most effective way to learn, but it seems that input from others, not discovery *per se*, is the crucial element of this effectiveness.

This means that discovery learning is less effective than we would expect if Piaget's theory of learning was correct.

The role of others in learning

One limitation of Piaget's theory is that he underestimated the role of others in learning.

Piaget saw other people as useful to learning in the sense that they are potential sources of information and learning experiences. However, he saw learning itself as an individual process. This contrasts with other theories in which learning is seen as a more social process, supported by more knowledgeable others. In particular Lev Vygotsky saw knowledge as existing first *between* the learner and the more experienced other and only then in the mind of the learner. This idea is explored more fully on pages 182–183. There is strong evidence to support the idea that learning is enhanced by interaction with others, and this is perhaps better explained by alternative theories.

This means that Piaget's theory may be an incomplete explanation for learning because it doesn't put enough emphasis on the role of other people in learning.

Evaluation eXtra

The role of motivation

Piaget suggested that children (and people of all ages) acquire new knowledge to escape the unpleasant sensation of disequilibrium. Thus the desire to learn is innately motivated – we are born with a desire to learn about the world.

However, it has been suggested that Piaget overstated the role of motivation in learning. One possible reason for this is the fact that Piaget studied an unrepresentative and highly intelligent sample of children – initially his own, then those in a university nursery. Perhaps these children were more motivated to learn than most.

Consider: *Is motivation to learn innate or learned?*



Science practicals are an example of discovery learning. Equilibration takes place when children find the answers through experiments.

Apply it Concepts — Equilibration and Masterchef

Gurpal is six years old. Recently she has seen her parents watching *Masterchef* and has begun to show an interest in food preparation. At first Gurpal has very little understanding of how the raw meat and vegetables she sees her parents unpacking become the food she sees at meals. She is frustrated and unhappy about this. After watching a couple of *Masterchef* episodes, however, Gurpal begins to grasp the idea of cooking. Once she gets this she is happier and more relaxed.

Questions

1. Outline what is meant by 'equilibration'.
2. Explain what has happened to Gurpal. Refer to the concept of equilibration in your answer.

Apply it Methods — Keen kids

A psychologist is interested in the role of equilibration in learning. She asks a Year 1 teacher and a Year 9 teacher to rate each of 30 children in a class on a scale of 1–10 (where 10 is very keen) for their enthusiasm to learn new things. For the Year 1 class the mean, median and mode were all 7 and the standard deviation was 1.5.

Questions

1. Sketch out the distribution of these scores. (*3 marks*)
2. What sort of distribution does your graph show? (*1 mark*)
3. Explain *one* strength and *one* limitation of using a teacher rating as a measure of intellectual curiosity. (*2 marks* + *2 marks*)
4. For the Year 9 class the mean was 4 and the standard deviation 2. What could you conclude about the differences between the two sets of scores from Year 1 and 9? (*3 marks*)

Check it

1. Outline what Piaget meant by 'schema'. *[3 marks]*
2. Explain the difference between 'assimilation' and 'accommodation'. *[4 marks]*
3. Outline **and** evaluate Piaget's concept of equilibration. *[8 marks]*
4. Describe **and** evaluate Piaget's theory of cognitive development. *[16 marks]*

Piaget's stages of intellectual development

The specification says...

Piaget's theory of cognitive development: stages of intellectual development. Characteristics of these stages, including object permanence, conservation, egocentrism and class inclusion.

Jean Piaget's approach to understanding cognitive/intellectual development was outlined on the previous spread. We now look at another key aspect of his theory.

Key terms

Stages of intellectual development Piaget identified four stages of intellectual development. Each stage is characterised by a different level of reasoning ability. Although the exact ages vary from child to child, the key point is that all children develop through the same *sequence* of stages.

Object permanence The ability to realise that an object still exists when it passes out of the visual field. Piaget believed that this ability appears at around eight months of age. Prior to this, children lose interest in an object once they can't see it and presumably are no longer aware of its existence.

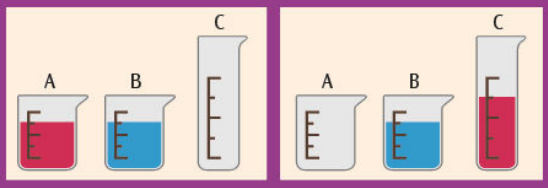
Conservation The ability to realise that quantity remains the same even when the appearance of an object or group of objects changes. For example, the volume of liquid stays the same when poured between vessels of different shapes.

Egocentrism The child's tendency to only be able to see the world from their own point of view. This applies to both physical objects – demonstrated in the three mountains task – and arguments in which a child can only appreciate their own perspective.

Class inclusion An advanced classification skill in which we recognise that classes of objects have subsets and are themselves subsets of larger classes. Pre-operational children usually struggle to place things in more than one class.



The three mountains task. Pre-operational children found it hard to identify the scene from the doll's viewpoint.



Piaget's liquid conservation task. Pre-operational children tended to say there is more liquid in the tall container (see description in text).

Piaget's stages of intellectual development

Sensorimotor stage (approximately 0–2 years)

According to Jean Piaget, a baby's early focus is on physical sensations and on developing some basic physical co-ordination. Babies learn by trial and error that they can deliberately move their body in particular ways, and eventually that they can move other objects. The baby also develops an understanding during the first two years that other people are separate objects and they acquire some basic language.

By around eight months the baby is capable of understanding **object permanence**. This is the understanding that objects still exist when they are out of sight. Piaget observed babies looking at objects and watched as the objects were removed from sight. He noted that before eight months, babies immediately switched their attention away from the object once it was out of sight. However, from around eight months they would continue to look for it. This led Piaget to believe that it was from this age that babies understood that objects continue to exist when removed from view.

Pre-operational stage (approximately 2–7 years)

By the age of two a toddler is mobile and can use language but still lacks adult reasoning ability. This means that they display some characteristic errors in reasoning.

Conservation This is the basic mathematical understanding that quantity remains constant even when the appearance of objects changes. Piaget demonstrated this in a number of situations. In his number conservation experiments, Piaget placed two rows of eight identical counters side by side. Even young children correctly reasoned that each row of counters had the same number. However, when the counters in one of the rows were pushed closer together, pre-operational children struggled to conserve and usually said there were fewer counters in that row.

In his liquid conservation procedure (see illustration below) Piaget found that when two identical containers (A and B) were placed side by side with the contents at the same height, most children spotted that they contained the same volume of liquid. However, if the liquid was poured into a taller, thinner vessel (C), younger children typically believed there was more liquid in the taller vessel.

Egocentrism This means to see the world only from one's own point of view. Piaget, working with Bärbel Inhelder (1956), described how egocentrism was demonstrated in the **three mountains task**, in which children were shown three model mountains, each with a different feature: a cross, a house or snow (see illustration below). A doll was placed at the side of the model so that it faced the scene from a different angle from the child. The child was asked to choose what the doll would 'see' from a range of pictures. Pre-operational children tended to find this difficult and often chose the picture that matched the scene from their own point of view.

Class inclusion Early in the pre-operational stage children begin to understand classification – the idea that objects fall into categories. So, most pre-operational children can classify pugs, bull terriers and retrievers as dogs. However, Piaget and Inhelder (1964) found that children under the age of seven struggle with the more advanced skill of class inclusion, the idea that classifications have subsets. So when they showed 7–8-year-old children pictures of five dogs and two cats and asked 'are there more dogs or animals?' children tended to respond that there were more dogs. He interpreted this as meaning that younger children cannot simultaneously see a dog as a member of the dog class *and* the animal class.

Stage of concrete operations (approximately 7–11 years)

Piaget found that from the age of around seven most children can conserve and perform much better on tasks of egocentrism and class inclusion. However, although children now have better externally-verifiable reasoning abilities – what Piaget called **operations** – these are strictly concrete operations, i.e. they can be applied only to physical objects in the child's presence. They still struggle to reason about abstract ideas and to imagine objects or situations they cannot see. Those more advanced abilities appear in the final stage of formal operations.

Stage of formal operations (11+)

Piaget believed that from about 11 years of age, children became capable of formal reasoning. This means that children become able to focus on the *form* of an argument and not be distracted by its content. Formal reasoning can be tested by using the pendulum task (see page 192) and also by means of syllogisms. For example: 'All yellow cats have two heads. I have a yellow cat called Charlie. How many heads does Charlie have?' The correct answer is 'two' (Smith *et al.* 1998). Piaget found that younger children became distracted by the content and answered that cats do not really have two heads. Piaget believed that once children can reason formally they are capable of scientific reasoning and become able to appreciate abstract ideas.

Evaluation

Practical activity on page 192

Conservation research

One limitation of Piaget's conclusions about conservation is that the research was flawed.

Children taking part in Piaget's conservation studies may have been influenced by seeing the experimenter change the appearance of the counters or liquid. Why would the researcher change the appearance and then ask them if it was the same? James McGarrigle and Margaret Donaldson (1974) set up a study in which the counters appeared to be moved by accident. In one condition they **replicated** the standard Piaget task with 4–6-year-olds and, like Piaget, they found that most children answered incorrectly. However, in another condition a 'naughty teddy' appeared and knocked the counters closer together, and now 72% correctly said there were the same number of counters as before.

This means that children aged 4–6 could conserve, as long as they were not put off by the way they were questioned. This in turn suggests that Piaget was wrong about the age at which conservation appears.

Class inclusion research

Another limitation is that findings on class inclusion are contradicted by newer research.

Robert Siegler and Matija Svetina (2006) showed that children were in fact capable of understanding class inclusion. Siegler and Svetina gave 100 five-year-olds from Slovenia ten class-inclusion tasks, receiving an explanation of the task after each session. In one condition they received feedback that there must be more animals than dogs because there were nine animals but only six dogs. A different group received feedback that there must be more animals because dogs were a subset of animals (a true explanation of class inclusion). The scores across the sessions improved more for the latter group, suggesting that the children had acquired a real understanding of class inclusion.

This means that children under seven can in fact understand class inclusion – contrary to what Piaget believed. So Piaget underestimated what younger children could do.

Egocentrism research

A further limitation is lack of support for Piaget's view of egocentrism.

Martin Hughes (1975) tested the ability of children to see a situation from two people's viewpoints using a model with two intersecting walls and three dolls, a boy and two police officers (similar to the three mountains task). Once familiarised with the task, children as young as 3½ years were able to position the boy doll where one police officer could not 'see' him 90% of the time, and four-year-olds could do this 90% of the time when there were two police officers to hide from.

This means that, when tested with a scenario that makes more sense, children are able to decentre and imagine other perspectives much earlier than Piaget proposed. This again suggests that Piaget underestimated the abilities of younger children and that his stages are incorrect.

Counterpoint One issue with all of the limitations explained on this page is that they are criticisms of the age at which a particular cognitive stage is reached, not a criticism of the characteristics of the stage itself. For example, Hughes' point is that children were able to decentre at a younger age than Piaget had claimed. However, it is still the case that this ability is not present in very young children and we can see from Hughes' research that the ability improves with age.

Therefore the core principles of Piaget's stages remain unchallenged but the methods he used meant the timing of his stages was wrong.

Evaluation eXtra

Domain-general and domain-specific

Piaget believed that intellectual development is a single process and that all aspects of cognition develop together. So language, reasoning and egocentrism all develop pretty much in tandem. By-and-large, for most children, this is indeed the case – if it were not then we could not have a school system that teaches a common curriculum to children according to their age.

However, research with autistic children suggests that actually these abilities may develop separately. Some autistic children also experience co-occurring learning disabilities, and they often face challenges with reasoning, language and egocentrism. But in other autistic children who do not have learning disabilities, these skills develop as they do in non-autistic children.

Consider: *Is cognitive development best seen as domain-general or domain-specific?*

Baillargeon challenged Piaget's ideas about object permanence – you can read about her research on pages 184–185.

Apply it Concepts — iPhone permanence

Since Roissin was a tiny baby she has been fascinated by the shiny case and bright screen of her mother's iPhone. For the last few months her mother has discouraged this interest by simply moving the phone out of her line of sight. However, Roissin is now eight months old and is no longer satisfied by this. She continues to reach for the phone after her mother has hidden it.

Question

Explain why Roissin's behaviour has changed at eight months of age. Refer to Piaget's concept of object permanence in your answer.

Apply it Concepts — Stealing sweets

Tom and Bob are brothers aged eight and five years old respectively. Their parents always give them an equal number of sweets, but Tom thinks, as the older child, he should have more. One day he puts a cunning plan into operation to get extra sweets. He places two rows of sweets side by side. In one row are there are ten sweets and in the other row eight. The row with eight sweets is longer because the sweets are slightly more spread out. He suggests to Bob that he might like the longer row.

Question

Explain Tom's reasoning. Make reference in your answer to the pre-operational stage, the stage of concrete operations and conservation.

Apply it Methods — Longitudinal research

Studies have not supported the idea that most people develop formal thinking skills in early adolescence. Joël Bradmetz (1999) followed up the development of 62 children from age 7 to 15 years, regularly testing them with a range of formal thinking tasks. At age 15 only one participant could reliably carry out the tasks. This is an example of a longitudinal study.

Questions

1. What is meant by a **longitudinal** study? (*2 marks*)
2. Outline *one* strength and *one* limitation of doing this as a longitudinal study. (*2 marks + 2 marks*)
3. Explain *one* reason why Bradmetz gave participants a range of formal reasoning tasks rather than just one. (*3 marks*)
4. Giving children formal reasoning tasks can be regarded as a more **valid** research technique than asking parents to rate their children for formal reasoning ability. Explain what is meant by this statement. (*3 marks*)

Check it

1. Identify **one** of Piaget's stages of intellectual development and outline the features of this stage. *[4 marks]*
2. Explain what Piaget meant by 'class inclusion'. *[4 marks]*
3. Outline how Piaget investigated conservation. *[3 marks]*
4. Describe **and** evaluate Piaget's stages of intellectual development. *[16 marks]*

Vygotsky's theory of cognitive development

The specification says...

Vygotsky's theory of cognitive development, including the zone of proximal development and scaffolding.

This spread is concerned with a second theory of cognitive development, that of Lev Vygotsky. The key difference between the two theories is that Vygotsky placed more emphasis on the role of other people in learning and cognitive development than Piaget did.

Key terms

Zone of proximal development (ZPD) This is the gap between a child's current level of development (defined by the cognitive tasks they can perform unaided) and what they can potentially do with the right help from a more expert other (an adult or a more advanced child).

Scaffolding The process of helping a learner cross the zone of proximal development (ZPD) and advance as much as they can, given their stage of development. Typically the level of help given in scaffolding declines as a learner crosses the zone of proximal development.

Apply it Concepts

The ZPD

Tarquin and Mark-Francis are identical twins. Anxious not to disadvantage them socially by sending them to the same school, their parents send them to different schools. Tarquin's school has a strong emphasis on personal responsibility in learning and so he spends a lot of time engaged in individual discovery learning. Mark-Francis on the other hand attends a school where the emphasis is very much on group work and adult help. The twins' parents are puzzled to find that Mark-Francis learns to read and do basic arithmetic much faster than Tarquin.

Question

Suggest a reason why Mark-Francis seems to be developing more quickly than Tarquin. Refer to Vygotsky's theory of cognitive development in your answer.



Adults are important in scaffolding children, and other children (peers) can help too.

Vygotsky's theory of cognitive development

Lev Vygotsky (1934) was a Russian psychologist who was influenced by Piaget's work. They agreed on many of the basics of **cognitive development**. Most importantly they agreed that children's reasoning abilities develop in a particular sequence, and that such abilities are qualitatively different at different ages, with a child typically capable of particular logic at particular ages.

The major difference is that Vygotsky saw cognitive development as a social process of learning from more experienced others (referred to as 'experts'). Knowledge is first *intermental*, between the more and less expert individual, then *intramental*, within the mind of the less expert individual. Vygotsky also saw language as a much more important part of cognitive development than Piaget did.

Cultural differences in cognitive abilities

If reasoning abilities are acquired from the more experienced individuals with whom a child has contact, it follows that the child will acquire the reasoning abilities of those particular people. This means that there may be cultural differences in cognitive development, with children picking up the mental 'tools' that will be most important for life within the physical, social and work environments of their culture. These mental tools include the hand–eye co-ordination needed to hunt with a bow and arrow and the evaluation skills needed to succeed in A level Psychology.

The zone of proximal development

Vygotsky put tremendous emphasis on the role of learning through interaction with others. He identified a gap between a child's current level of development, i.e. what they can understand and do alone, and what they can potentially understand after interaction with more expert others. This gap is known as the **zone of proximal development** (or ZPD).

Expert assistance allows a child to cross the ZPD and understand as much of a subject or situation as they are capable – children are still to some extent limited by their developmental stage. Vygotsky believed that children develop a more advanced understanding of a situation and hence the more advanced reasoning abilities needed to deal with it by learning from others, as opposed to through individual exploration of the world.

Critically, Vygotsky was not just saying that children can learn more facts during social interaction, but also that they acquire more advanced reasoning abilities. In fact he believed that higher mental functions, such as formal reasoning, could *only* be acquired through interaction with more advanced others.

Scaffolding

The term **scaffolding** refers to all the kinds of help adults and more advanced peers give a child to help them to cross the zone of proximal development. Actually Vygotsky did not focus much on this process in his writing, and so most of what we know about scaffolding is from psychologists influenced by his theory, such as Jerome Bruner and colleagues, so this approach is sometimes called 'the Vygotsky-Bruner model'.

David Wood, Jerome Bruner and Gail Ross (1976) noted the particular strategies that experts use when scaffolding (as shown below). In general, as a learner crosses the zone of proximal development, the level of help given in scaffolding declines from level 5 (most help) to level 1 (least help). An adult is more likely to use a high level of help strategies when first helping, then to gradually withdraw the level of help as the child grasps the task.

An example of scaffolding: helping a child draw		
Level of help	Nature of prompt	Example
5	Demonstration	Adult draws an object with crayons.
4	Preparation for child	Adult helps child grasp a crayon.
3	Indication of materials	Adult points to crayons.
2	Specific verbal instructions	Adult says 'How about the green crayon?'
1	General prompts	Adult says 'Now draw something else'.

Evaluation

Support for the ZPD

One strength of Vygotsky's theory is research support for the ZPD.

There is clear evidence to show that there is indeed a gap between the level of reasoning a child can achieve on their own and what they can achieve with help from a more expert other. An example of such a study comes from Antonio Roazzi and Peter Bryant (1998). They gave children aged 4–5 years the task of estimating the number of sweets in a box. In one condition the children worked alone and in another they worked with the help of an older child. Most children working alone failed to give a good estimate (i.e. one that was close to the actual answer). In the expert help condition the older (expert) children were observed to offer prompts, pointing the younger children in the right direction to work out how to arrive at their estimate. Most 4–5-year-olds receiving this kind of help successfully mastered the task.

This shows that children can develop additional reasoning abilities when working with a more expert individual. This in turn suggests that the zone of proximal development is a valid concept.

Support for scaffolding

Another strength of Vygotsky's theory is research support for scaffolding.

It has been observed in many studies – such as that of Roazzi and Bryant above – that adults and older children provide support for younger children learning to master new tasks. But research also shows that the level of help given by an expert partner declines during the process of learning, as predicted by the principle of scaffolding. For example David Conner and David Cross (2003) used a longitudinal procedure to follow up 45 children, observing them engaged in problem-solving tasks with the help of their mothers at 16, 26, 44 and 54 months. Distinctive changes in help were observed over time – the mothers used less and less direct intervention and more hints and prompts as children gained experience. Mothers also increasingly offered help when it was needed rather than constantly.

This means that adult assistance with children's learning is well described by the concept of scaffolding.

Real-world application

A further strength is practical application in education.

Vygotsky's ideas have been highly influential in education in the 21st century. The idea that children can learn more and faster with appropriate scaffolding has raised expectations of what they should be able to achieve. Social interaction in learning, through group work, peer tutoring and individual adult assistance from teachers and teaching assistants, has been used to scaffold children though their ZPD. There is evidence to suggest that these strategies are effective. For example Hilde Van Keer and Jean Pierre Verhaeghe (2005) found that 7-year-olds tutored by 10-year-olds, in addition to their whole-class teaching, progressed further in reading than controls who just had standard whole-class teaching. A review of the usefulness of teaching assistants (Alborz *et al.* 2009) concluded that teaching assistants are very effective at improving the rate of learning in children.

This means that Vygotsky's ideas have value in real-world settings.

Counterpoint Although Vygotsky's ideas about the role of social interaction have had useful applications, these may not be universal. Charlotte Liu and Robert Matthews (2005) point out that in China classes of up to 50 children learn very effectively in lecture-style classrooms with very few individual interactions with peers or tutors. This should not be possible if Vygotsky were entirely correct.

This means that Vygotsky may have overestimated the importance of scaffolding in learning.

Evaluation eXtra

Vygotsky versus Piaget

There is plenty of evidence to support the idea that, as Vygotsky said, interaction with a more experienced other can enhance learning. We have seen this in studies by Conner and Cross and Van Keer and Verhaeghe above.

However, if Vygotsky was right about the process of interactive learning, we would expect all children learning together to pick up very similar skills and a very similar mental representation of material. Recall that Christine Howe *et al.* (1992) found that what children learn actually varies considerably between individuals, even in group learning situations (see page 179).

Consider: *Does evidence favour Vygotsky's or Piaget's view of learning?*



Teaching assistants have an important role in guiding children through their zones of proximal development.

Apply it Concepts — Scaffolding homework

Seven-year-old Brianna now has maths homework. Mum Lisa helps Brianna with her homework every weekend. At the start of the year Brianna is anxious and unsure how to begin each piece of homework. By the end of the year though she is in a good routine. Lisa finds that the kind of help she gives Brianna changes during the year.

Question

Suggest how the kind of help Lisa gives Brianna will change during the course of the year. Refer to the concept of scaffolding in your answer.

Apply it Methods — Van Keer and Verhaeghe study

In the study by Van Keer and Verhaeghe (2005) classes that were taught using whole-class teaching plus peer tutoring were compared with classes just taught by whole-class teaching. Existing classes were allocated to each condition as opposed to individual children. This study can therefore be described as a natural experiment.

Questions

1. Outline the key features of a **natural experiment**. (*2 marks*)
2. Explain *one* strength and *one* limitation of natural experiments as compared to **lab experiments**. Refer to this study in your answer. (*3 marks + 3 marks*)
3. This study used **standardised** measures of reading to judge progress in each condition. Briefly explain *one* strength of using standardised measures. (*2 marks*)
4. In the Van Keer and Verhaeghe study, the group that had the benefit of peer tutoring maintained their superior reading when followed up a few months later. Explain *one* strength of studies that follow up initial findings like this. (*2 marks*)

Study tip

The concepts of the zone of proximal development and scaffolding are closely related. Be clear on what each means, and if asked about one or the other, make sure you explain that thoroughly. It is, however, fine to mention ZPD and scaffolding in an explanation of either.

Check it

1. Outline what Vygotsky meant by the 'zone of proximal development'. *[4 marks]*
2. Explain the role of 'scaffolding' in cognitive development. *[4 marks]*
3. Evaluate the concept of scaffolding. *[4 marks]*
4. Describe **and** evaluate Vygotsky's theory of cognitive development. *[16 marks]*

Baillargeon's explanation of infant abilities

The specification says...

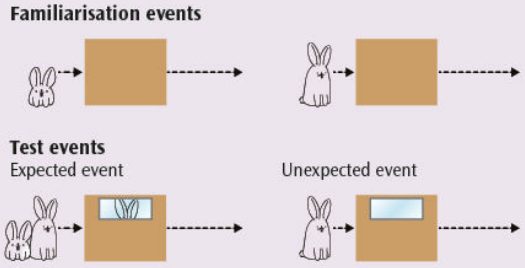
> Baillargeon's explanation of early infant abilities, including knowledge of the physical world; violation of expectation research.

This spread is concerned with an extensive range of research from Renée Baillargeon into understanding exactly how well developed cognitive abilities are in infancy. Baillargeon has challenged Piaget's ideas about the sensorimotor stage, proposing that even very young babies have a fairly well-developed understanding of the physical world, including object permanence.

Key terms

Knowledge of the physical world Refers to our understanding of how the physical world works. An example of this knowledge is object permanence, the understanding that objects continue to exist when they leave the visual field. There is a debate concerning the ages at which children develop this kind of knowledge.

Violation of expectation research A method used to investigate infant knowledge of the world. The idea is that if children understand how the physical world operates then they will expect certain things to happen in particular situations. If these do not occur and children show surprise, this suggests that they have an intact knowledge of that aspect of the world.



Apply it Concepts

Violation of expectation

Gwyneth has two daughters, Storm, aged five years and Skye, four months. For Storm's birthday party Gwyneth books a magician. Gwyneth does not expect Skye to enjoy the magician but she is surprised to see that Skye stares with great attention whenever the magician appears to make an object appear or disappear.

Question

Explain why Skye might be so fascinated by the magic show. Refer to violation of expectation and Baillargeon's explanation for infant abilities in your answer.

Baillargeon's explanation of infant abilities

Early research on knowledge of the physical world

You have studied Jean Piaget's ideas about the **sensorimotor stage** (page 180). Piaget believed that babies less than 8–9 months of age have a very primitive understanding of the nature of the physical world. For example, he claimed that babies lack knowledge of **object permanence** (see page 180). Piaget's reasoning was based on his research showing that babies would lose interest in an object once the object was out of sight.

Renée Baillargeon, for example, suggested that young babies had a better understanding of the physical world than Piaget had suggested. She proposed that the lack of understanding of object permanence could be explained differently. For example young babies might lack the necessary motor skills to pursue a hidden object or they may just lose interest because they are easily distracted.

Violation of expectation research

Baillargeon needed new techniques to investigate her belief in babies' superior abilities. One of the techniques she developed is the **violation of expectation** (VOE) method. Baillargeon (2004) explains VOE as follows: 'In a typical experiment, [babies] see two test events – an expected event, which is consistent with the expectation examined in the experiment, and an unexpected event, which violates this expectation'. So if the VOE method is used to test object permanence, infants will typically see two conditions in which objects pass in and out of sight. This is illustrated in the study below.

Procedure In an early VOE experiment Baillargeon together with Marcia Graber (1987) showed 24 babies, aged 5–6 months, a tall and a short rabbit passing behind a screen with a window. In the familiarisation event (see top pictures on left), a baby is shown a short rabbit and a tall rabbit disappearing as they pass behind a screen – as fits our expectations of object permanence.

In the test events there are two conditions – one expected event where a short rabbit now passes behind a screen with a window and, because of the height of the window, the short rabbit is not visible until it appears on the other side. (The expected event might also be the tall rabbit passing behind the window and being seen.) In the second condition, the unexpected event, the tall rabbit would not be seen through the window as it moves from one side of the screen to the other.

A baby who has object permanence should show surprise when shown the unexpected event.

Findings The babies looked for an average of 33.07 seconds at the unexpected event compared to 25.11 seconds at the expected event. The researchers interpreted this as meaning that the babies were surprised at the unexpected condition. For them to be surprised it follows that they must have known that the tall rabbit should have reappeared at the window. This demonstrates a good understanding of object permanence.

Other studies The Baillargeon and Graber study described above is an example of an *occlusion* study, in which one object occludes another, i.e. it is in front of it. VOE experiments have also been used to test infant understanding of *containment* and *support*. 'Containment' is the idea that when an object is seen to enter a container it should still be there when the container is opened. 'Support' is the idea that an object should fall when unsupported but not when it is on a horizontal surface. In all these cases infants have shown that they pay more attention to unexpected (impossible) events and so appear to have a good understanding of the physical world (Hespos and Baillargeon 2008).

Baillargeon's theory of infant physical reasoning

Baillargeon *et al.* (2012) proposed that humans are born with a *physical reasoning system* (or PRS). In other words we are born hardwired with both a basic understanding of the physical world and also the ability to learn more details easily. Initially we have a primitive awareness of the physical properties of the world and this becomes more sophisticated as we learn from experience. One aspect of the world of which we have a crude understanding from birth is *object persistence*. This is roughly the same idea as Piaget's object permanence – it is the idea that an object remains in existence and does not spontaneously alter in structure.

Development proceeds as follows – in the first few weeks of life babies begin to identify event categories. Each event category corresponds to one way in which objects interact. For example, occlusion events take place when one object blocks the view of another. Because a baby is born with a basic understanding of object persistence and quickly learns that one object can block their view of another, by the time they are tested in tasks like Baillargeon and Graber's VOE with tall and short rabbits, babies actually have a good understanding that the tall rabbit should appear at the window. The 'unexpected' event captures the baby's attention because the nature of their PRS means they are predisposed to attend to new events that might allow them to develop their understanding of the physical world.

Evaluation

Validity of violation of expectation

One strength of Baillargeon's research is the **validity** of the VOE method.

The VOE method gets around an important limitation of Piaget's research – his assumption that when a baby loses interest in a hidden object they no longer believe it exists. Piaget's method of studying object permanence cannot distinguish between this and the alternative possibility that the baby simply became distracted by other visual stimuli and therefore stopped looking in the original place. The VOE method overcomes this because 'distraction' would not affect the outcome. In the VOE the only thing being measured is how long the baby looks at the visual scene – looking away from the scene would not be recorded.

This means that Baillargeon's VOE method has greater validity than Piaget's because a **confounding variable** is controlled. This also provides support for her theory explaining early cognitive development.

Counterpoint Piaget pointed out that acting in accordance with a principle is not the same as understanding it (Bremner 2013). Even if babies are able to recognise and devote more attention to unexpected events, this does not necessarily mean that they understand them. Understanding something means it can be thought about consciously and applied to reasoning about different aspects of the world.

This means that, even though babies do appear to respond to unexpected conditions, this may not represent a change in their cognitive abilities.

May not be object permanence

One limitation of Baillargeon's research is the assumption that response to VOE is linked to unexpectedness and hence object permanence.

Piaget (above) suggested that babies respond to unexpected events but that this does not mean they truly understand it. A further methodological issue is that babies' response may not even be to the unexpectedness of the event. All VOE shows is that babies find certain events more *interesting*. We are inferring a link between this response and object permanence. Actually, although the different length of time spent looking at two different events may well reflect one being more interesting than the other, this may not be because the baby sees it as unexpected. It could be interesting for some other reason.

This means that the VOE method may not be an entirely valid way to study a very young child's understanding of the physical world.

Universal understanding

A further strength of Baillargeon's explanation is its ability to explain universal understanding of the physical world.

As Susan Hespos and Kristy van Marle (2012) point out, we all have a very good understanding of the basic characteristics of the physical world regardless of culture and personal experience. For example, everyone understands that if we drop a key ring it will fall to the ground. This does not require past experience of dropping keys or even a culture that makes use of keys. This universal understanding suggests that a basic understanding of the physical world is **innate**. If it were not innate we would expect significant cultural and individual differences and there is no evidence for these.

This innate basic understanding of the physical world suggests that Baillargeon's PRS is correct.

Evaluation eXtra

Credibility

There have been challenges to the idea of the PRS. Not only is it difficult to determine whether a baby is really responding to the unexpected nature of an event, but even if the baby is, this may not indicate real understanding.

However, one thing that enhances the credibility of the PRS is its consistency with what we already know about the development of other visual systems. For example babies can use crude patterns to judge distance at an early age, but experience is needed to make use of more subtle visual cues.

Consider: *In the absence of direct evidence for the PRS, how credible is the idea?*



The understanding that dropped keys will fall to the floor is universal and does not appear to require learning, supporting Baillargeon's idea of the PRS.

Apply it
Concepts

Children understanding physical properties

Baillargeon suggested that even very young infants have a crude awareness of the physical properties of objects. Nursery nurse Tina is surprised at the reaction when she drops her keys behind a desk one day. The keys land silently in an open drawer rather than jingling noisily on the floor. Tina finds the children who saw the keys fall looking intently. She wonders about this.

Question

How could you explain to Tina why the children might have been so interested by this event. Refer to Baillargeon's theory in your answer.

Apply it
Methods

Staring at the unexpected

In the Baillargeon and Graber (1987) study (facing page) infants looked for an average of 33.07 seconds at an unexpected condition as opposed to 25.11 seconds at an expected condition.

Questions

1. The **mean** was used as the measure of average. Explain why the mean was the most appropriate average to use in this study. (*2 marks*)
2. Plot the means on a **bar chart**. Pay attention to the scale on your *y*-axis and to following the conventions of bar charts. (*4 marks*)
3. Time in seconds can be described as **interval data**. Explain what this means. (*2 marks*)
4. What would be the most appropriate **statistical test** to use to assess the significance of the results in this study? Explain your choice. (*3 marks*)

Check it

1. Explain what is meant by 'violation of expectation'. *[4 marks]*
2. Outline Baillargeon's explanation of early infant abilities, including knowledge of the physical world. *[6 marks]*
3. Describe **one** study of violation of expectation. In your answer include details of procedure **and** findings. *[6 marks]*
4. Describe **and** evaluate Baillargeon's explanation of early infant abilities. *[16 marks]*

Social cognition: Selman's levels of perspective-taking

The specification says...

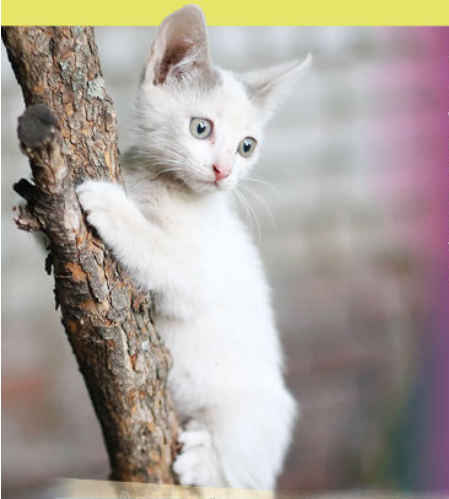
The development of social cognition: Selman's levels of perspective-taking.

This is the first of three spreads dealing with social cognition, the mental processes (cognitions) that underlie human social interaction. We start with the work of Robert Selman, who studied the role of perspective-taking in children's development of pro-social reasoning.

Key terms

Social cognition Describes the mental processes we make use of when engaged in social interaction. For example, we make decisions on how to behave based on our understanding of a social situation. Both the understanding and the decision-making are cognitive processes.

Perspective-taking Our ability to appreciate a social situation from the perspective (point of view) of other people. This cognitive ability underlies much of our normal social interaction. Referred to specifically as 'social perspective-taking' or also called 'role-taking' because we take on the role of another and therefore their perspective.



Whether to risk upsetting a worried parent by rescuing a kitten is a complex social decision that involves taking the perspective of everyone involved.

Apply it Concepts

Spenny and Lauren's computer time

Selma and Emma are working to limit the time their children, Spenny (aged 11) and Lauren (aged 5), spend playing computer games. Spenny seems able to appreciate his parents' point of view although it is not convenient for him. Lauren, however, is very resistant to alternative activities. She can see that her parents are worried by this but cannot understand why.

Question

Referring to Selman's stages, explain why Spenny's and Lauren's responses are so different.

Selman's levels of perspective-taking

Robert Selman (1971, 1976) was concerned with how children develop **perspective-taking**, or more specifically *social* perspective-taking. This is different from Jean Piaget's idea of *physical* perspective-taking (**egocentrism**), demonstrated with the **three mountains task** (see page 180). Social perspective-taking concerns what someone else is feeling or thinking, i.e. **social cognition**.

Piaget believed in domain-general **cognitive development**, so he believed that physical and social perspective-taking would occur hand-in-hand. Selman proposed that the development of social perspective-taking is a separate process, a domain-specific approach to explaining cognitive development.

Perspective-taking research

Selman (1971) looked at changes that occurred with age in children's responses to scenarios in which they were asked to take the role of different people in a social situation.

Procedure 30 boys and 30 girls took part in the study, 20 four-year-olds, 20 five-year-olds and 20 six-year-olds. All were individually given a task designed to measure perspective-taking ability. This involved asking them how each person felt in various scenarios. One scenario featured a child called Holly who has promised her father she will no longer climb trees, but who then comes across her friend whose kitten is stuck up a tree. The task was to describe and explain how each person (Holly, her friend and her father) would feel if Holly did or did not climb the tree to rescue the kitten.

Findings A number of distinct levels of perspective-taking were identified (see below). Selman found that the level of perspective-taking correlated with age, suggesting a clear developmental sequence.

Selman's stages of development

Selman used his perspective-taking research (above) to formulate a stage theory of social perspective-taking – he actually used the term 'role-taking' i.e. how taking the role of another person allows a child to see situations from the others' perspective.

- Stage 0 (3–6 years) *Egocentric* – a child in this stage cannot reliably distinguish between their own emotions and those of others. They can generally identify emotional states in others but do not understand what social behaviour might have caused them.
- Stage 1 (6–8 years) *Social-informational* – a child can now tell the difference between their own point of view and that of others, but they can usually focus on only one of these perspectives.
- Stage 2 (8–10 years) *Self-reflective* – at this stage a child can put themselves in the position of another person and fully appreciate the other's perspective. They can, however, only take on board one point of view at a time.
- Stage 3 (10–12 years) *Mutual* – children are now able to look at a situation from their own and another's point of view at the same time.
- Stage 4 (12 years +) *Social and conventional system* – young people become able to see that sometimes understanding others' viewpoints is not enough to allow people to reach agreement. This is why social conventions are needed to keep order.

Selman believed that development through these stages is based on both maturity and experience.

Later developments to Selman's theory

Selman has recognised that the above descriptions of cognitive reasoning do not fully explain social development. There are also three aspects to social development (Schultz *et al.* 2003):

1. *Interpersonal understanding* – this is what Selman measured in his earlier perspective-taking research. If we can take different roles then we can understand social situations.
2. *Interpersonal negotiation strategies* – as well as understanding what others think in social situations we also have to develop skills in how to respond to them. We therefore develop social skills such as asserting our position and managing conflict.
3. *Awareness of personal meaning of relationships* – as well as understanding social situations and how to manage them, social development also requires the ability to reflect on social behaviour in the context of different relationships. Thus a violent gang-member may have an advanced social understanding and good social skills, but chooses a simple approach to conflict (violence) because of their role in the gang.

Evaluation

Research support for stages

One strength of Selman's stages is evidence that perspective-taking becomes more advanced with age.

Selman (1971) tested 60 children (boys and girls aged 4–6 years old) using scenarios like that involving Holly and the kitten (see facing page). There were **significant positive correlations** between age and the ability to take different perspectives. This **cross-sectional** research has since been supported by the findings of **longitudinal** studies (e.g. Gurucharri and Selman 1982). Such longitudinal studies have followed children over a period of time and recorded improvements in their perspective-taking ability. Longitudinal studies have good **validity** because they control for individual differences whereas cross-sectional studies don't.

This means that there is solid support from different lines of research for Selman's most basic idea, that perspective-taking improves with age.

Research support for perspective-taking

A further strength of Selman's stages is support for the importance of perspective-taking in healthy social development.

A key element of Selman's approach is the importance of perspective-taking in social development. This is supported by an observational study of child–parent interaction in toyshops and supermarkets. Moniek Buijzen and Patti Valkenburg (2008) observed interactions including those in which parents refused to buy things their child wanted. The researchers noted any coercive behaviour in the children (i.e. trying to force parents to buy them things), which is an example of unhealthy social behaviour. The study found **negative correlations** between coercive behaviour and both age and perspective-taking ability (assessed by interview).

This suggests that there is a relationship between perspective-taking abilities and healthy social behaviour.

Counterpoint Other lines of research have not supported the links between perspective-taking and social development. For example, Luciano Gasser and Monika Keller (2009) assessed perspective-taking in bullies, victims and non-participants. They found that bullies displayed no difficulties in perspective-taking.

This suggests that perspective-taking may not be a key element in healthy social development.

Too cognitive

One limitation of Selman's stages is the focus on cognitive factors alone.

Perspective-taking is a cognitive ability. However there is far more to children's social development than their increasing cognitive abilities. By focusing on the cognitive element of development, Selman's approach fails to take into account the full range of other factors that impact on a child's social development. Other internal factors include the development of empathy and emotional self-regulation. There are also important external factors including parenting style, family climate and opportunities to learn from peer interaction.

This means that Selman's approach to explaining social development is too narrow.

Evaluation eXtra

Nurture or nature?

There is some evidence for cultural differences in perspective-taking ability. Shali Wu and Boaz Keysar (2007) compared American and matched Chinese children and found that the Chinese children were significantly more advanced. This suggests that cultural influences might be important.

However, Selman believed that his stages of perspective-taking were based primarily on cognitive maturity (i.e. biologically-driven) and hence universal (Vassallo 2017).

Consider: *Is perspective-taking driven by nature or nature?*



Children who find it difficult to take on board others' perspectives may also find social interaction challenging.

Apply it Concepts — Anders

Anders is ten years old. On a recent shopping trip he had a meltdown when he asked for an expensive computer game and his parents tried to explain that they could not afford it for the moment. It appeared that he could not appreciate their perspective on the matter.

Question

What could you tell Anders' parents about his development of perspective-taking? Refer to Selman's stages in your answer.

Apply it Methods — Different designs

Selman used both cross-sectional and longitudinal designs in his research into the development of perspective-taking. For example, Selman (1971) compared groups of four-, five- and six-year-olds on their perspective-taking abilities, whilst Gurucharri and Selman (1982) followed up children, testing whether their perspective-taking abilities changed with age.

Questions

1. Explain what is meant by a **cross-sectional design**. (*2 marks*)
2. Explain what is meant by a **longitudinal design**. (*2 marks*)
3. Outline *one* strength of using a longitudinal design in the study by Gurucharri and Selman. (*2 marks*)
4. Outline *two* strengths of using a cross-sectional design in the study by Selman. (*4 marks*)

Check it

1. Explain what is meant by 'social cognition'. *[4 marks]*
2. Outline Selman's levels of perspective-taking. *[6 marks]*
3. Outline **one** of Selman's levels of perspective-taking. *[2 marks]*
4. Describe **and** evaluate Selman's work on perspective-taking. *[16 marks]*

Social cognition: Theory of mind

The specification says...

The development of social cognition: theory of mind, including theory of mind as an explanation for autism; the Sally-Anne study.

This is the second spread dealing with social cognition, the mental processes that underlie human social interaction. In particular we deal here with theory of mind, our understanding of what is going on in the mind of another person. Theory of mind, or rather a lack of it, has been proposed as an explanation for autism. The Sally-Anne study is an example of a false belief task, used to study theory of mind.

Key terms

Theory of mind (ToM) Our personal understanding (a 'theory') of what other people are thinking and feeling. It is sometimes called 'mind-reading'.

Autism This is a broad term for a wide range ('spectrum') of features. Autistic people face challenges with social interaction/communication and repetitive/restricted behaviours. As a spectrum condition, autism affects people in different ways and co-occurs with learning disability in some.

Sally–Anne study Uses the Sally–Anne task to assess theory of mind. To understand the story participants have to identify that Sally will look for a marble in the wrong place because she does not know that Anne has moved it. Autistic children and very young non-autistic children find this challenging.

The Sally–Anne task



An example of an item from the Eyes Task.



Theory of mind

You could be forgiven for thinking **theory of mind** (ToM) is a psychological theory. It isn't! It refers to the ability that each of us has to 'mind-read' or to have a personal theory of what other people know or are feeling or thinking. Each of us has a theory of mind when we have a belief (i.e. a theory) about what is in someone else's mind.

Different methods are used to study ToM at different points in development. The emergence of simple ToM can be seen in toddlers by means of intentional reasoning research. A more sophisticated level of ToM can be assessed in 3–4-year-olds using false belief tasks. In older children and adults, advanced ToM has been tested with the **Eyes Task** (see below), in which participants judge complex emotions with minimal information about facial expression.

Intentional reasoning in toddlers

In one study Andrew Meltzoff (1988) provided convincing evidence to show that toddlers (aged about 18 months) have an understanding of adult intentions when carrying out simple actions. Children of 18 months observed adults place beads into a jar. In the **experimental condition** the adults appeared to struggle with this and some beads fell outside the jar. In the **control condition** the adults placed the beads successfully in the jar. In both conditions the toddlers did successfully place the beads in the jar, they dropped no more beads in the experimental condition. This suggests they were imitating what the adult *intended* to do rather than what the adults actually did. This kind of research shows that very young children have a simple ToM.

False belief tasks

False belief tasks were developed in order to test whether children can understand that people can believe something that is not true. The first was developed by Heinz Wimmer and Josef Perner (1983). They told 3–4-year-olds a story in which Maxi left his chocolate in a *blue* cupboard in the kitchen and then went to the playground. Later, Maxi's mother used some of the chocolate in her cooking and placed the remainder in the *green* cupboard. Children were asked where Maxi would look for his chocolate when he comes back from the playground. Most 3-year-olds incorrectly said that he would look in the *green* cupboard because they are assuming that Maxi knows what they know, i.e. that Maxi's mother moved the chocolate. However, most 4-year-olds correctly identified the *blue* cupboard. This suggests that ToM undergoes a shift and becomes more advanced at around 4 years of age.

Sally-Anne study

Simon Baron-Cohen *et al.* (1985) used a similar false belief task called the **Sally–Anne task** (see left). Children were told a story involving two dolls, Sally and Anne. Sally places a marble in her basket, but when Sally is not looking Anne moves the marble to her box. The task is to work out where Sally will look for her marble. Understanding that Sally does not know that Anne has moved the marble requires an understanding of Sally's false belief about where it is.

Baron-Cohen and colleagues have explored the links between ToM deficits and **autism** using false belief tasks. Much of the research has made use of the Sally–Anne task, for example, the following study by Baron-Cohen *et al.* (1985).

Procedure The Sally-Anne task was given individually to 20 autistic children, 27 non-autistic children and 14 children with **Down syndrome** (**control groups**).

Findings 85% of children in the control groups correctly identified where Sally would look for her marble. However, only four of the autistic children (20%) were able to answer this. Baron-Cohen *et al.* argued that this difference showed that autism involves a ToM deficit and that this may in fact be a complete explanation for autism.

Testing older children and adults

Many autistic people who do not have learning disabilities have challenges with empathy, social communication and imagination but their language development may be relatively unaffected. Studies of older autistic children and adults without a learning disability showed that this group could succeed on false belief tasks. This was a blow to the idea that autism can be explained by ToM deficits.

However, Baron-Cohen and colleagues developed a more challenging task to assess ToM in adolescents and adults. The Eyes Task (see example on left) involves reading complex emotions in pictures of faces just showing a small area around the eyes. Baron-Cohen *et al.* (1997) found that many autistic adults without a learning disability struggled with the Eyes Task. This supports the idea that ToM deficits might be a cause of autism.

Evaluation

Practical activity on page 193

False belief tasks

One limitation of ToM research has been the reliance on false belief tasks to test the theory.

Hundreds of studies have made use of false belief tasks like the Sally–Anne task, however, false belief tasks may have serious problems of **validity** (Bloom and German 2000). One reason for this is that false belief tasks require other cognitive abilities such as visual memory – failure on a false belief task may thus be due to a deficit in memory rather than ToM. Also, some children who can engage successfully in pretend play, which requires some ToM ability, nonetheless find false belief tasks difficult.

This means that false belief tasks may not really measure ToM and therefore ToM lacks key research evidence.

Theory of mind versus perspective-taking

A further limitation is that research techniques fail to distinguish ToM from perspective-taking.

Perspective-taking (see previous spread) and ToM are related but are actually different cognitive abilities. It can be very difficult to be sure we are measuring one and not the other. For example, in intentional reasoning tasks a child might be visualising the beads task from the adult perspective rather than expressing a conscious understanding of their intention. In the Sally–Anne task a child might be switching perspective between Sally and Anne.

This means that, with the exception of the Eyes Task, tasks designed to measure ToM may actually measure perspective-taking.

Real-world application

One strength of ToM research is its application to understanding autism.

The tests used to assess ToM (e.g. false belief tasks) are challenging for some autistic people, possibly because they may not fully understand what other people are thinking. This in turn offers an explanation for why some autistic people may find social interaction difficult – it is hard to interact with someone if you don't get a sense of what they are thinking and feeling. In contrast, it is often assumed (incorrectly – see below) that most neurotypical people can 'pick up' another person's thoughts and feelings with little effort.

This means that ToM research has real-world relevance.

Counterpoint Nevertheless ToM does not provide a complete explanation for autism. Not every autistic person experiences ToM issues (e.g. not always understanding what someone else is thinking), nor are ToM problems limited to autistic people (Tager-Flusberg 2007). Also a lack of ToM cannot explain the cognitive strengths of autistic people (e.g. superior visual attention).

This means that there must be other factors that are involved in autism, and the association between autism and ToM is not as strong as first believed.

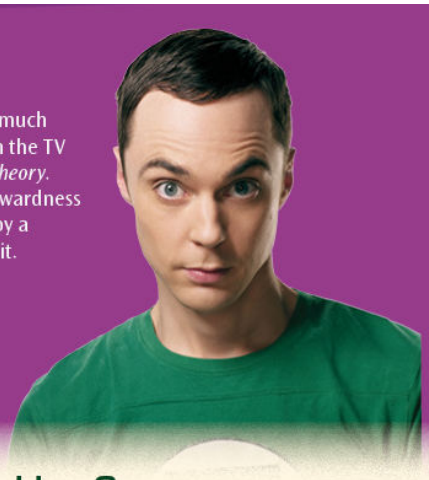
Evaluation eXtra

Nature and nurture

Josef Perner *et al.* (2002) suggests that ToM is an innate ability which develops alongside other cognitive abilities, largely as a result of maturity. This is in line with Jean Piaget's view that progressively more abstract thinking develops as we get older and the brain matures. Cross-cultural studies (e.g. Liu *et al.* 2004) have found a similar pattern of development of ToM abilities in different cultures.

In contrast, Janet Wilde Astington (1998) suggests a more Vygotskian explanation. She suggests ToM develops as a consequence of our interactions with others, and gradually the concept of ToM is internalised. The study by David Liu *et al.* (above) noted that ToM abilities did not necessarily develop at the same age in different cultures, just in the same sequence.

Consider: *Where does ToM come from?*



Sheldon Cooper is a much loved character from the TV show *The Big Bang Theory*. Sheldon's social awkwardness could be explained by a theory of mind deficit.

Apply it Concepts — Sheldon Cooper

It has been suggested by many viewers (including autistic people) that Sheldon Cooper, the much-loved character from *The Big Bang Theory*, is autistic. Although he has many strengths (e.g. his intellectual abilities), Sheldon struggles to read facial expressions, resists changing his routine in response to the wishes of others and does not 'get' sarcasm. He finds social interaction in general a challenge.

Question

Explain Sheldon's characteristics with regard to theory of mind and its possible role in autism.

Apply it Methods — ToM tasks

Baron-Cohen *et al.*'s Sally–Anne study (facing page) compared performance on the Sally–Anne task of three groups: 20 autistic children and 41 children who either were non-autistic or had Down syndrome. The researchers found that 85% of children in the Down syndrome and non-autistic groups got the answer right whereas only 20% of the autistic children did.

Questions

1. Explain why an **independent groups design** was used in this study. (*2 marks*)
2. Present these findings on a suitable graph. (*4 marks*)
3. Present the numbers of children getting the Sally–Anne task right in the experimental and control conditions as fractions of the total. (*2 marks*)

Apply it Concepts — Tyrone's homework

Tyrone is in infant school and has just misplaced his first piece of homework. His teacher does not believe Tyrone when he says he completed the work. Tyrone finds this response very difficult to understand and gets extremely confused and upset.

Question

Explain Tyrone's response to the situation using the concept of theory of mind. You might refer to the Sally–Anne study in your answer.

Check it

1. Outline **one** Sally–Anne study. *[4 marks]*
2. Explain what is meant by 'theory of mind'. *[2 marks]*
3. Evaluate theory of mind as an explanation for autism. *[4 marks]*
4. Describe **and** evaluate research into theory of mind. *[16 marks]*

Social cognition: The mirror neuron system

The specification says...

The role of the mirror neuron system in social cognition.

This is the final spread dealing with social cognition, the mental processes that underlie human social interaction. On this spread we consider the likely role of a particular class of brain cell, the mirror neuron. It seems likely that mirror neurons are involved in the social-cognitive processes of empathy, understanding intention, perspective-taking and theory of mind – the topics studied on the two previous spreads.

Key term

The mirror neuron system Consists of special brain cells called mirror neurons distributed in several areas of the brain. Mirror neurons are unique because they fire both in response to personal action and in response to action on the part of others. These special neurons may be involved in social cognition, allowing us to interpret intention and emotion in others.

Study tip

This is quite a current area of research so it may pay to do some extra reading so you are well informed. Use Google Scholar to find out about recent research on mirror neurons.

According to Ramachandran the ability to share the emotions of those around us is due to mirror neurons and this ability has shaped the development of human society.



The role of mirror neurons

The discovery of mirror neurons

Like many great scientific discoveries, researchers came across mirror neurons quite by accident. Giacomo Rizzolatti *et al.* (2002) were studying electrical activity in a monkey's **motor cortex** (the part of the brain controlling movement) when one of the researchers reached for his lunch in view of the monkey. This monkey's motor cortex became activated in exactly the same way as it did when the animal itself reached for food. Further investigation revealed that it was in fact the same brain cells that fired when the monkey reached itself or watched someone else reach. The researchers called these cells **mirror neurons** because the neurons mirror motor activity in another individual.

Mirror neurons and intention

Identifying mirror neurons has given us a whole new way of thinking about the way we understand each other's intentions – this is central to social cognition. Vittorio Gallese and Alvin Goldman (1998) suggested that mirror neurons respond not just to observed actions but to intentions behind behaviour. Rather than the common-sense view that we interpret people's actions with reference to our memory, Gallese and Goldman suggested that we simulate others' actions in our motor system and experience their intentions using our mirror neurons.

Mirror neurons and perspective-taking

It has also been suggested that mirror neurons are important in other social-cognitive functions, for example, theory of mind and the ability to take others' perspectives. If mirror neurons fire in response to others' actions and intentions this may give us a neural mechanism for experiencing, and hence understanding, other people's perspectives and emotional states. Just as we can simulate intention by making judgements based on our own reflected motor responses, this same information may allow us to interpret what others are thinking and feeling.

Mirror neurons and human evolution

Vilayanur Ramachandran (2011) has suggested that mirror neurons are so important that they have effectively shaped human evolution. The uniquely complex social interactions we have as humans require a brain system that facilitates an understanding of intention, emotion and perspective. Without these cognitive abilities we could not live in the large groups with the complex social roles and rules that characterise human culture. Ramachandran suggests that mirror neurons are absolutely key to understanding the way humans have developed as a social species.

Mirror neurons and autism

A major source of evidence concerning mirror neurons and perspective-taking comes from the study of mirror neurons in autistic children. Some features of autism are associated with all the social-cognitive abilities linked to mirror neurons. If autistic children can be shown to have a dysfunctional mirror neuron system then this may go a long way to explaining autism.

Ramachandran, along with Lindsay Oberman (2006) have proposed the 'broken mirror' theory of autism. This is the idea that neurological deficits that include dysfunction in the mirror neuron system prevent a developing child imitating and understanding social behaviour in others. This manifests itself in infancy when children later diagnosed as autistic typically mimic adult behaviour less than others. Later, problems with the mirror neuron system lead to challenges in social communication as children do not fully develop the usual abilities to read intention and emotion in others.

Apply it Concepts

Andy Murray wins Wimbledon

In 2013 Andy Murray won the prestigious Wimbledon Tennis Tournament. This was watched by a record 17 million people. Millions of people shared Murray's joy at finally winning the competition after trying unsuccessfully for several years.

Question

Explain how the public response to Murray's struggle and eventual win might have involved their mirror neurons.

Evaluation

Research support

One strength of mirror neurons is the existence of supporting evidence.

There is evidence from neuroscience to support a role for mirror neurons in a range of human behaviours. For example, Helene Haker *et al*. (2012) scanned the brains of people as they watched a film of people yawning. Levels of activity in *Brodmann's Area 9*, believed to be rich in mirror neurons, increased when participants yawned in response. Contagious yawning is widely believed to be the result of empathy, so this study links mirror neuron activity to empathy. Another study by Marco Iacoboni *et al.* (2005) showed that activity in the inferior frontal gyrus (also rich in mirror neurons) increased significantly when the participants tried to understand the *intentions* behind a hand-grasping gesture (picking up a cup). In other words, mirror neurons encoded *why* an object was being grasped.

This means that mirror neurons may play a role in important aspects of social cognition, including empathy and understanding intentions.

Hard to research

One limitation of mirror neuron research is measuring neuron activity.

Animal studies of mirror neurons often involve implanting electrodes in the brain in order to study electrical activity in individual neurons. However, it is ethically impossible to use this kind of procedure in humans and such animal studies tell us little about human cognition. An alternative is to use scanning techniques (the approach used by Haker *et al*. cited above). However, scanning techniques only measure activity in brain areas not individual cells.

Therefore there is no 'gold standard' for measuring mirror neuron activity in humans (Bekkali *et al*. 2019), and no direct evidence for mirror neuron activity in humans.

Explaining autism

One strength of mirror neuron research is support for explaining autism.

There is some evidence to support a link between autism and dysfunctions in the mirror neuron system (Hadjikhani 2007). For example brain scans have shown a smaller average thickness of the *pars opercularis* in autistic people compared with **neurotypical** people. This is an area thought to be especially rich in mirror neurons and thought to be involved in perspective-taking. Other studies (e.g. Nishitani *et al*. 2004) using scanning methods that show activity rather than just structure, have found lower activity levels in regions of the brain believed to be associated with high concentrations of mirror neurons, again in autistic people compared with neurotypicals.

This suggests that a cause of autism may be related to the mirror neuron system.

Counterpoint Although some research has supported a link between autism and abnormal structure or function in the mirror neuron system, a systematic review of 25 studies by Antonia Hamilton (2013) concluded that evidence was highly inconsistent and results hard to interpret. This means there may not be a link between autism and mirror neuron activity after all.

Evaluation eXtra

Mirror neurons and perspective-taking

The link between mirror neurons and perspective-taking is supported in a physical sense. Monica Maranesi *et al*. (2017) found that specific mirror neurons in monkeys' motor cortex fired according to the position and angle from which experimenters gestured. This shows that physical perspective is encoded by mirror neurons.

However, a recent review by Soukayna Bekkali *et al*. (2019) concluded that there is only weak evidence linking mirror neurons to social cognition in humans.

Consider: *Is evidence for physical perspective-taking enough to make wider claims for the importance of mirror neurons in human cognition?*



Apply it Concepts — Contagious yawning

Clem and Cammi are bored. Cammi yawns and a few seconds later Clem also yawns. They laugh at this and wonder why it is that when one person yawns so do others around them. They ask their friend Clint about this as he has studied psychology. 'That'll be your mirror neurons,' he says.

Question

Explain what Clint means by this. How could contagious yawning be explained by mirror neurons?

Apply it Methods — Contagious yawning and stats

Haker *et al*. (top left) found that the mean proportion of viewed yawns that elicited a yawn in response was 55%. There was a range from 33% to 100%, with a standard deviation of 30.

There was a difference in activation of *Brodmann's Area 9* in the brain between participants who saw the yawning film and those who saw a neutral film. This difference was significant at the level of $p < 0.001$.

Questions

1. Explain what is meant by a standard deviation. (*2 marks*)
2. Explain what a standard deviation of 30 means in this study. (*2 marks*)
3. If the median result was 58% and the mode was 61%, would the frequency distribution of the results show a positive or negative skew? Explain your answer. (*2 marks*)
4. Explain what is meant by the phrase 'This difference was significant at the level of $p < 0.001$'. (*2 marks*)

Check it

1. Outline what is meant by 'mirror neurons'. *[4 marks]*
2. Explain the role of mirror neurons in social cognition. *[6 marks]*
3. Evaluate research into mirror neurons. *[8 marks]*
4. Outline **and** evaluate the role of mirror neurons in social cognition. *[16 marks]*

Practical corner

The specification says...

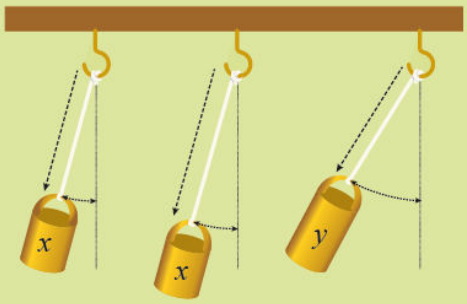
> Knowledge and understanding of ... research methods, practical research skills and maths skills. These should be developed through ... ethical practical research activities.

This means that you should conduct practical investigations wherever possible. For both practical and ethical reasons we don't recommend you carry out practical work with young children, but there are relevant things you can do using your peers as participants as suggested here. One practical uses a questionnaire technique, the other involves carrying out a quasi-experiment online.

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?



Piaget's pendulum task is an example of a test for formal reasoning. The task is to work out whether the speed of swing is due to the mass of the weight, string length or height of swing.

Practical idea 1: Formal reasoning in teenagers

Much of the research in this chapter has been carried out on young children but there are some topics where teenagers make suitable participants and it is ethically more appropriate. So this first suggestion for a practical activity involves teenagers and concerns Piaget's idea of formal reasoning.

The **aim** of this study is to test Piaget's idea that most teenagers can carry out formal reasoning tasks. Remember that, although Piaget believed this, most later researchers have concluded that he was extremely optimistic. This is important as it means you shouldn't feel bad if you find the task hard. You will be using a **questionnaire** method.

The practical bit

You are testing the idea that 16–19-year-old students can successfully carry out formal reasoning tasks. This is not an **experiment** – you are not controlling an **independent variable** here, just testing a simple idea on a single group of participants.

Choosing your participants

The representativeness of your **sample** is quite important for this study. Remember you are testing Piaget's idea that most teenagers can do formal thinking tasks. If your sample is not fairly representative of teenagers then you won't really be testing that idea. Your sample **population** will probably be your peers in your own college or school sixth form. You will need to decide on a sampling procedure. A **random** method is likely to produce a fairly representative sample but you may decide to prioritise sample size and ask all available students to participate.

Formal thinking tasks

We have identified syllogisms as one type of formal thinking task (page 180). You can find more here: www.simplypsychology.org/formal-operational.html. An important decision you will have to make concerns how many tasks you give your participants. If you just use one task it will be quick for participants, meaning plenty of willing volunteers. However, a single task might be too easy or hard and therefore not fairly represent formal reasoning. Using several tasks may be a more **valid** assessment but you risk a lower response rate.

Ethical issues

You will almost certainly find that some of your participants will not be able to do all the tasks you set them. This raises issues of **confidentiality** – you cannot reveal to anyone which participants failed the tasks. Anonymise data before sharing it. You also need to be quite sure participants have given **informed consent** and are fully aware of their **right to withdraw**. You will need a **debrief** handy that makes it very clear that research has found that most teenagers struggle with formal reasoning tasks. You must not lower anyone's **self-esteem** by letting them leave the study thinking they are stupid.

Analysing your data

This should be extremely straightforward because you are not comparing two conditions or looking for a relationship between variables. You will need a table and graph to summarise your findings. You could use a **bar chart** to represent the data, with two columns for each task (number who did the task correctly and number who did it incorrectly). You may also wish to use a statistical test (see question 2 below).

Apply it
Methods

The maths bit 1

Table 1 Correct and incorrect answers for three tests of formal reasoning.

Task	Number correct	Number incorrect
Syllogism	18	7
Pendulum	5	20
Extra eye task	16	9

1. (a) In Table 1 on the left, express the numbers correct and incorrect for syllogisms as fractions. (2 marks)
   (b) Express them as ratios. (2 marks)
2. What **statistical test** would you use to analyse the **significance** of the results on each of the three tasks? Explain your answer. (*3 marks*)
3. The significance for the pendulum task is $p < 0.05$. Explain what this means. (*3 marks*)
4. Draw a **bar chart** to represent the data in Table 1. (*4 marks*)
5. What conclusion would you reach based on Table 1? (*1 mark*)

Practical idea 2: Gender differences in advanced theory of mind

Recall the idea of **theory of mind** (page 188). The **Eyes Task**, developed by Simon Baron-Cohen *et al.* (1997) tests advanced theory of mind. In the original study it was found that in the **neurotypical** group women scored a mean of 21.8 correct out of 25 whereas men averaged 18.8 correct.

The aim of this study is to **replicate** Baron-Cohen *et al.*'s study, just using neurotypical women and men. This is a **quasi-experiment** because you will be comparing genders. The independent variable is gender and the **dependent variable** is advanced theory of mind as measured by the number of items correct on the Eyes Test.



Reflective vs. Unreflective



Sympathetic vs. Unsympathetic

Baron-Cohen and colleagues found that men typically did slightly worse than women on the Eyes Task.

The practical bit

It is important to ensure that, as far as possible, you have control over your variables. You can arrange for all participants to take the Eyes Task online but you need to ensure that conditions are comparable. The same would apply if doing a pen-and-pencil version of the test.

Choosing your participants

If your aim is to compare Eyes Task performance between genders you will need a comparable group of women and men. You may wish to use a **matched pairs design** and draw up a list of characteristics you might use for matching.

Administering the Eyes Task

We recommend running the test online (see right). This will take care of a lot of **extraneous variables** for you and ensure your participants have a highly standardised experience. It will also help avoid the kind of mistakes I (Matt) tend to make in experiments like dropping piles of paper on the floor and getting them muddled up!

You can, if you wish, print the test out and administer it that way but you must ensure standardised procedures.

Ethical issues

There are important ethical issues. Remember that you are not competent to conduct research on participants with any developmental disorders. You should not therefore involve participants who are autistic. Neither, however, should you offend autistic students by deliberately excluding them if they wish to participate. Refer any autistic volunteers to your teacher who will need to make a judgement.

If anyone does have low scores, do not suggest that they might be autistic (although if someone is anxious about their low score refer them to your teacher). As always take care to preserve the **anonymity** of your participants and don't identify low-scorers.

Presenting your data

This is a straightforward gender comparison so your tables and graphs should be designed to compare two conditions. You will need a **measure of central tendency** for the number of items women and men get right. Consider as well an appropriate **measure of dispersion**. You may also wish to use a statistical test (see question 3 below).

The Eyes Test

There are two versions of the Eyes Test available. The original version has 25 items and the updated version has 37. Either should be fine for your practical. You can run the Eyes Test online at the following websites:

www.questionwritertracker.com/quiz/61/Z4MK3TKB.html

http://kgajos.eecs.harvard.edu/mite/

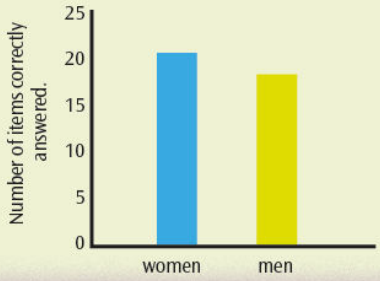
Or you can download a paper version at this site:

www.autismresearchcentre.com/arc_tests

The maths bit

Overall, at least 10% of the marks in assessments for Psychology will require the use of mathematical skills and this is included in the requirement that at least 25–30% in total will involve research methods.

Graph showing number of items correct on the Eyes Test.



Apply it Methods

The maths bit 2

1. The graph on the left represents the findings of Baron-Cohen *et al.* (1997). What does this graph tell us about the average performance of women and men on the Eyes Task? (*2 marks*)
2. Create a set of data that could produce the bar chart on the left. (*4 marks*)
3. What statistical test could you use with this data? Explain your answer. (*3 marks*)
4. Explain why the data shown on this graph can be described as **quantitative data**. (*3 marks*)

Revision summaries

Piaget

The process of acquiring knowledge.

Theory of cognitive development

Children do not simply know less than adults.

Children and adults think in qualitatively different ways.

Schema

A mental structure containing all we know about one aspect of the world, including me-schema – and later even abstract ideas. Schema become more detailed and sophisticated over time as the child learns.

Motivation to learn

Not understanding something causes disequilibrium.

This is unpleasant so child is motivated to escape it by learning.

The result is a state of equilibration (new knowledge restores balance).

Assimilation and accommodation

Either assimilate by adding new information to existing schema.

Or accommodate to radically new experiences by forming new schema.

Evaluation

Research support

Children watched objects on slope, formed individual mental representations i.e. schema (Howe *et al.*)

Real-world application

Piaget's discovery learning through exploration led to activity-based classrooms and flipped learning.

Counterpoint – no firm support for superior learning following discovery learning, teacher input may be more key (Lazonder and Harmsen).

The role of others in learning

Underestimated by Piaget, evidence supports Vygotsky's view of important interaction between learner and others.

Evaluation extra: Motivation

Piaget suggested that we are innately motivated to learn, however his research was based on children from university-educated families.

Each stage characterised by particular mental abilities.

Stages of intellectual development

Sensorimotor stage (0–2 years)

Babies acquire basic physical co-ordination, object permanence (8 months) and basic language.

Object permanence = child understands that objects continue to exist when no longer visible.

Pre-operational stage (2–7 years)

Child lacks logic so is egocentric and fails tests of conservation and class inclusion.

- Conservation – child fails to understand quantities cannot change, tested with e.g. liquid in glasses.
- Egocentrism – child fails to see another's perspective, tested by three mountains task.
- Class inclusion – child fails to recognise subsets within larger classes, tested with questions e.g. about dogs and animals.

Stage of concrete operations (7–11 years)

Child has basic logic so can perform tasks of decentring, conservation and class inclusion.

However, logical operations require physical objects.

Stage of formal operations (11+ years)

Children become capable of full adult reasoning, including about abstract ideas and scientific reasoning.

Evaluation

Conservation research

When a 'naughty teddy' rearranged the counters, 72% of children under 7 could conserve (McGarrigle and Donaldson).

Class inclusion research

5-year-olds could demonstrate class inclusion if given a logical explanation in their feedback (Siegler and Svetina).

Egocentrism research

Children of 3½ can decentre – policeman task more realistic though children of 4 still better (Hughes).

Counterpoint – all the criticisms above focus only on the age at which a stage occurs not the basic sequence.

Evaluation extra: Domain general and domain specific

Piaget's theory is domain-general. However, this cannot explain autism, in which some abilities develop better than others.

Vygotsky

Emphasises the role of other people.

Theory of cognitive development

Social processes – knowledge is first intermental (between people), then intramental (in the mind of the individual).

Cultural differences in cognitive abilities

Children pick up the 'mental tools' used for physical, social and work environments in their culture.

The zone of proximal development (ZPD)

The ZPD is the gap between what a child can learn on their own and with an expert helper.

Most advanced reasoning can only be achieved with the help of experts, not simply through exploration.

Scaffolding

The process of helping a learner cross the ZPD and advance as much as they can, given their stage of development. Stages are:

- Demonstration.
- Preparation for child.
- Indication of materials.
- Specific verbal instructions.
- General prompts.

Evaluation

Support for the ZPD

4–5-year-olds performed better with help from more expert peers (Roazzi and Bryant).

Support for scaffolding

Decreased intervention in help given by mothers as their children got older, and help increasingly offered only when needed (Conner and Cross).

Real-world application

Methods increasingly used in the 21st century. 7-year-olds receiving peer tutoring progressed further in reading than controls (Van Keer and Verhaeghe).

Counterpoint – in China large classes in lecture-style classrooms learn effectively with no scaffolding (Liu and Matthews).

Evaluation extra: Vygotsky versus Piaget

Vygotsky suggests interaction enhances learning, but then all children should develop similar ideas.

Baillargeon

Very young babies have a well-developed understanding of the physical world.

Explanation of infant abilities

Early research on knowledge of the physical world

Piaget proposed children didn't understand object permanence until 8 months.

Baillargeon suggested babies had a better understanding of the world, apparent lack of ability due to poor motor skills or being distracted.

Violation of expectation research

Babies' attention to expected and unexpected events is compared.

E.g. Baillargeon and Graber showed short and tall rabbit passing behind a window.

Babies looked longer in unexpected condition (tall rabbit did not appear at the window).

Other studies tested understanding of containment and of support.

Baillargeon's theory of infant physical reasoning

Babies born with a physical reasoning system (PRS), including object persistence which helps them interpret events (when baby sees one object block another they learn about occlusion).

Evaluation

Validity of violation of expectation

Lack of object permanence may be because infant has been distracted, VOE eliminates this confounding variable.

Counterpoint – acting in accordance with a principle is not the same as understanding it (Piaget).

May not be object permanence

Cannot directly tell what a baby understands but have to infer it from their behaviour. We are assuming that VOE response is to the unexpectedness, it may just be more interesting.

Universal understanding

Children all appear to have some understanding of the physical world regardless of their experiences (e.g. dropping a key), suggests an innate PRS.

Evaluation extra: Credibility

Responding to unexpected event doesn't mean understanding which undermines PRS, but other research supports it (e.g. development of other visual systems also innate and then develop).

Social cognition

Selman's levels of perspective-taking

Mental processes underlying social interaction.

The explanation

Domain-specific (Selman) versus domain-general (Piaget).

Perspective-taking research

Selman used scenarios to test perspective-taking abilities.

Procedure – 60 children of various ages asked to imagine how different people feel in a situation, e.g. Holly and kitten.

Findings – clear developmental sequence.

Selman's stages of development

Development of perspective/role-taking abilities occurs because of both maturity and experience.

- Stage 0 (3–6 years) – Egocentric.
- Stage 1 (6–8 years) – Social-informational.
- Stage 2 (8–10 years) – Self-reflective.
- Stage 3 (10–12 years) – Mutual.
- Stage 4 (12 years +) – Social and conventional system.

Later developments to Selman's theory

Selman added three further dimensions:

1. Interpersonal understanding, i.e. role-taking.
2. Interpersonal negotiation, e.g. managing conflict.
3. Awareness of personal meaning of relationships, i.e. social behaviour adjusted according to who the others are.

Evaluation

Research support for stages

Both cross-sectional (Selman) and longitudinal (Gurucharri and Selman) studies support Selman's idea that perspective-taking gets more advanced with age.

Research support for perspective-taking

Negative correlations between coercive shopping behaviour in children and both age and perspective-taking ability (Buijzen and Valkenburg).

Counterpoint – bullies show normal perspective-taking, suggests no link between perspective-taking and pro-social development (Gasser and Keller).

Too cognitive

Selman's theory may be overly cognitive, failing to include other factors, e.g. development of empathy and emotional self-regulation, parenting style, peer interactions.

Evaluation extra: Nurture or nature?

Evidence of cultural differences in perspective-taking, e.g. American and Chinese children (Wu and Keysar), but Selman sees perspective-taking mostly due to maturity.

Theory of mind

Understanding of what is going on in the mind of another person.

The explanation

A personal theory, tested via different methods depending on age.

Intentional reasoning in toddlers

Some adults dropped the beads outside the jar, but toddlers imitated intentions showing some understanding of intention, i.e. basic ToM (Meltzoff).

False belief tasks

Maxi's mother moves chocolate from blue to green cupboard, where does he look? 3-year-olds get it wrong (Wimmer and Perner).

Sally–Anne study

A false belief task requiring an understanding that Sally will look in the wrong place for a marble because she does not know that Anne has moved it.

ToM deficits in autistic children (Baron-Cohen *et al.*).

Testing older children and adults

Eyes Task used to demonstrate that adults also have ToM deficits (Baron-Cohen *et al.*).

Evaluation

False belief tasks

Lack validity because they may test memory as well as ToM. Children who can cope with pretend play (requires ToM) still struggle with false belief tasks (Bloom and German).

Theory of mind versus perspective-taking

Hard to distinguish ToM and perspective-taking, research into ToM (e.g. intentional reasoning task) could equally be measuring perspective-taking.

Real-world application

ToM research has proved useful in understanding communication challenges in autistic people.

Counterpoint – ToM does not provide a complete explanation for autism. Some autistic people do not have ToM problems and vice versa.

Evaluation extra: Nature and nurture

ToM driven by maturation (Perner) and similar pattern cross-culturally (Liu *et al.*), but interactions may matter (Wilde Astington) which explains different rates of development cross-culturally.

The mirror neuron system

Brain cells underlying empathy, understanding intention and perspective-taking.

The explanation

The discovery of mirror neurons

Mirror neurons first discovered in monkeys' motor cortex, responded to own and others' activity (Rizzolatti *et al.*).

Mirror neurons and intention

Mirror neurons in the motor cortex may allow us to simulate actions of others and so help us understand their intentions (Gallese and Goldman).

Mirror neurons and perspective-taking

Ability to simulate others' actions may help us to understand their perspective and can explain ToM.

Mirror neurons and human evolution

Mirror neurons have shaped the direction of human evolution by allowing us to live in large complex groups with roles and rules (Ramachandran).

Mirror neurons and autism

Autism may be the result of a 'broken' mirror neuron system because autism associated with understanding social behaviour (Ramachandran and Oberman).

Evaluation

Research support

fMRI showed *Brodmann's Area 9* involved in yawning (Haker *et al.*). Activity in inferior frontal gyrus when understanding intentions behind hand-grasp (Iacoboni *et al.*).

Hard to research

Electrodes used in animal studies but only scanning is ethical in humans, which doesn't measure individual cells.

Explaining autism

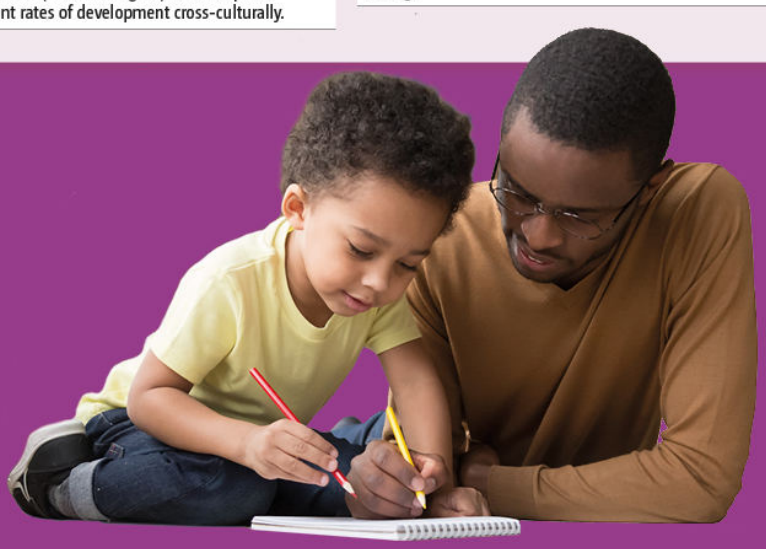
Pars opercularis has smaller thickness in autistic people (Hadjikhani), activity also lower in areas rich in mirror neurons (Nishitani *et al.*).

Counterpoint – review of 25 studies linking autism to brain structure/activity shows evidence is inconsistent (Hamilton).

Evaluation extra: Mirror neurons and perspective-taking

There is evidence to show mirror neurons are involved in physical perspective-taking in animals, but a lack of direct evidence for involvement in human social perspective-taking.





Practice questions, answers and feedback

Question 1 A psychologist who was interested in the work of Piaget selected two groups of children, aged 5 and aged 10, for an experiment. Each child was presented individually with two identical balls of clay. The psychologist then rolled one of the balls into a sausage shape. Each child was asked to say whether the amount of clay in each piece was 'the same' or whether 'one had more'.

Explain which cognitive ability is being tested in the experiment above. (*2 marks*)

Morticia's answer *This is an example of a conservation experiment where children are tested to see if they realise the quantity doesn't change despite its appearance changing.*	A good, clear answer which names the cognitive ability and explains it well.
Luke's answer *The ability to conserve.*	Straight to the point from Luke! But more than an identification was required.
Vladimir's answer *The children's cognitive ability is being tested here to see what children can do at different ages. Older children become capable of more abstract thinking and don't get confused by the shape of the clay objects. They understand the logical principles.*	Vladimir has misunderstood the nature of the study in the stem here and has therefore not answered the question.

Question 2 The psychologist found that there was a difference in the cognitive ability of the 5-year-olds and the 10-year-olds in the experiment described in question 1.

Identify **and** explain **one** other difference in cognitive ability between 5-year-olds and 10-year-olds that Piaget identified. (*3 marks*)

Morticia's answer *Piaget also looked at egocentricity. This is the fact that young children see the world from their own point of view.*	Morticia has identified the difference but only done a little bit more as she has not explained how older children see the world differently.
Luke's answer *Egocentricity changes with age, as in the three mountains study. Children were asked to identify the view of three mountains from the perspective of a doll. Young children selected a view that was actually what they saw, but older children could imagine how it would be from a different position – therefore they were no longer egocentric.*	Although not required by the question, Luke has used evidence effectively to illustrate the difference between the age groups.
Vladimir's answer *Children who are older can understand conservation. This is a difference in cognitive ability. They can keep quantities constant and know that they wouldn't change.*	Unfortunately, this is the cognitive ability Vladimir should have focused on in question 1. Even allowing for that his explanation of conservation is weak.

Question 3 Outline Vygotsky's theory of cognitive development. (*4 marks*)

Morticia's answer *Vygotsky wrote a theory about cognitive development about the same time as Piaget and they had some similar ideas which they shared. The central point in Vygotsky's theory was that thinking develops because of social influences. It is the input from other people especially experts that helps children to develop their thinking. An expert is just anyone who knows more so it could be peers as well as parents and teachers.*	The first part of Morticia's answer does not really reveal anything about Vygotsky's theory. The rest of the response focuses on just one key aspect – social influences.
Luke's answer *One of Vygotsky's key concepts was the zone of proximal development (ZPD). At any time there is a gap between a child's current level of development, i.e. what they can understand and do alone, and what they can potentially understand after interaction with more expert others. The assistance of experts enables a child to cross the ZPD.* *Experts do this using scaffolding. They provide assistance such as engaging interest, focusing a child on task, highlighting key things to pay attention to and demonstrating what to do. In this way a child is assisted in doing things that are challenging and cognitive development takes place.*	Luke provides an accurate and detailed summary of Vygotsky's theory which includes appropriate terminology.
Vladimir's answer *Vygotsky's theory was about helping learners to do things they couldn't do. Piaget was much more focused on the individual learning for themselves whereas Vygotsky saw the child being taught by others especially through the process of scaffolding. Scaffolding is a process like giving someone a scaffold to climb on, it gives them some structure to help them do things that are quite hard. Vygotsky's theory was influenced by Piaget because they both thought children's abilities develop in a sequence. His work has led to lots of educational applications such as peer tutoring.*	Vladimir's response is not quite as articulate and well-expressed as Luke's – though there is lots of good content and understanding. Unlike Luke, Vladimir does not identify the ZPD but does understand the concept and has accurately described scaffolding and peer tutoring.

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

Question 4 Describe **and** evaluate research into theory of mind. (*16 marks*)

Luke's answer *Theory of mind refers to the idea that each of us can form a theory of what is in other people's minds. This is an important part of social development. Meltzoff demonstrated that even children of 18 months have some understanding of intention, which is basic ToM. Wimmer and Perner used the story of Maxi to test children and found that, from around age 4, children can cope with tasks requiring an understanding of false beliefs.*	The first sentence of Luke's answer is rather like common sense but the rest of the paragraph is well informed and includes some concise use of evidence (though it may have been helpful to explain the concept of 'false belief').
Baron-Cohen et al. proposed that a lack of ToM might explain autism and used the Sally-Anne task to show possible ToM deficits in autistic children. Baron-Cohen et al. further developed the Eyes Task to demonstrate that autistic adults also had ToM deficits. The Eyes Task was used because the Sally-Anne test was too easy for adults but the Eyes Task shows that adults continue to have difficulties.	In paragraph 2 there are again references to relevant evidence but precious little detail in terms of procedure and findings. The Sally-Anne task and the Eyes Task could be described in more depth.
The tests used to assess ToM and false beliefs have been criticised so we may not be able to rely on these findings. First of all Bloom and German suggest that the reason children fail the false belief tasks is not because they lack ToM but because the tasks require a lot to be remembered, so it may be memory rather than ToM that explains successful performance.	A relevant evaluation point in this paragraph that is well expanded.
Bloom and German also suggest that children with ToM may still struggle with false belief tasks so that this way of assessing ToM may be flawed. This is a big problem for the research because that's the main way that ToM is tested so research may not be assessing ToM at all.	Again, relevant critique.
The Eyes Task has also been accused of lacking validity because it involves the use of static eyes but people don't read emotions from motionless eyes in real-life situations. So the Eyes Task is really not testing anything meaningful.	Good point again here (and one not mentioned in this book).
A further issue is that it is difficult to distinguish ToM from perspective-taking. Perspective-taking is a lower-level ability where you are simply seeing the world as if standing where someone else is and this is not the same as understanding thoughts and emotions, it could be that the tests of ToM are simply assessing perspective-taking.	In these essays the term 'research' can equally refer to the theory or relevant studies so this is good commentary.
The assumption that a lack of ToM might explain autism is not justified as the research, at best, just shows that the two may be associated. It is quite different to suggest that lack of ToM is the cause. It could be an effect. **(400 words)**	An unusual essay insofar as the evaluation/discussion is better than the description. The response would have been improved with more basic detail on the theory and associated studies. Some explanation of what theory of mind is would be helpful.
Vladimir's answer *Theory of mind has been used to study autistic people. These are people who find social interaction challenging and it might be because they lack a theory of mind. The Sally-Anne test is used to test this ability. You have two dolls called Sally and Anne. Sally has a ball that she puts in her basket and then she leaves the room. While she is gone, Anne moves the ball to a box. So the child who is watching knows the ball is really in the box and not the basket. The question is, when Sally returns where will she look? If the child who is watching has a theory of mind they would say Sally should look in the basket but a child without a theory of mind will say in the box because they think everyone will know what they know. When autistic children are tested, they generally struggle. This might explain why they find social interaction a challenge – because they may not always understand what someone is thinking/feeling which makes it harder to interact. I know someone who has autism and this is similar to his behaviour because he sometimes finds it difficult to talk to others.*	Almost the opposite problem to Luke's answer here: Vladimir has overdone the description of the Sally-Anne study. More focus on the details of the theory would have been a better strategy. The study is used effectively with the link to social difficulties but the anecdotal reference at the end of the paragraph does not add anything to the answer.
Another study tested theory of mind using pictures of eyes. People had to say what emotion was being expressed by the eyes. This requires a kind of mind reading. Again autistic children found this difficult. The test was also used with autistic adults who didn't do well either.	This point is somewhat vague and would benefit from some reference to evidence.
This research is useful because it tells us about what might be causing autism. It could help autistic people because it helps explain why they find social interaction challenging and therefore people might help them more with interaction. On the other hand this detracts from the fact that autistic people have strengths, such as good visual attention skills.	Paragraph 3 is reasonably well-explained and has a nice counterpoint, which is a way of showing off your discussion skills.
The problems with this research are that it is difficult to test autistic children because they don't understand what they are being asked to do. Another problem is that it might not be ethical to test autistic children. It might upset them. The theory is reductionist because it reduces autism to one thing whereas it is more complex than that.	Again, a rather vague paragraph. The final point related to 'reductionism' is speculative and suggests Vladimir has run out of things to say!
Theory of mind is also studied in neurotypical children using similar tests and other tests as well. They usually develop theory of mind around the age of 2 or 3. That helps their social development because they can understand others. **(406 words)**	Overall, this response focuses slightly too much on description rather than evaluation.

Multiple-choice questions

Piaget's theory of cognitive development

1. The major force underlying learning in Piaget's theory is:
   (a) Disequilibrium.
   (b) Reinforcement.
   (c) Modelling.
   (d) Culture.

2. A schema is best described as:
   (a) A stage of development.
   (b) A way to overcome disequilibrium.
   (c) A unit of knowledge.
   (d) An area of the brain.

3. Which of the following educational strategies is a direct result of Piaget's theory?
   (a) Emphasis on language and literacy.
   (b) Discovery learning.
   (c) Co-operative group work.
   (d) Use of the cane.

4. Which of the following terms best describes learning that involves radical change to schema?
   (a) Assimilation.
   (b) Disequilibrium.
   (c) Equilibration.
   (d) Accommodation.

5. Which of the following is a valid criticism of Piaget's theory?
   (a) It has no practical applications.
   (b) It does not take full account of the role of other people in learning.
   (c) Discovery learning does not work.
   (d) There is no evidence for the formation of individual mental representations.

Piaget's stages of intellectual development

1. At what approximate age did Piaget believe children acquired object permanence?
   (a) 3 months.
   (b) 8 months.
   (c) 18 months.
   (d) 24 months.

2. Which of the following refers to a child's tendency to see the world only from their own perspective?
   (a) Egocentrism.
   (b) Conservation.
   (c) Class inclusion.
   (d) Object permanence.

3. Which of the following refers to the child's developing ability to understand quantity?
   (a) Egocentrism.
   (b) Conservation.
   (c) Class inclusion.
   (d) Object permanence.

4. Which of the following only becomes true at Piaget's stage of formal operations?
   (a) Children become capable of conservation for the first time.
   (b) Egocentrism begins to decline.
   (c) Children become capable of scientific reasoning.
   (d) Children become capable of class inclusion.

5. Which of the following is *not* a valid criticism of Piaget's theory?
   (a) Piaget's methods of investigation were appropriate.
   (b) Piaget's questioning techniques, for example in assessing conservation, have been criticised.
   (c) Piaget underestimated the abilities of younger children.
   (d) Piaget's conclusions about class inclusion have been questioned.

Vygotsky's theory of cognitive development

1. Vygotsky emphasised the role of which of the following in development?
   (a) Disequilibrium.
   (b) Maturation.
   (c) Interaction.
   (d) Punishment.

2. According to Vygotsky mental tools are:
   (a) Present at birth.
   (b) Acquired through the medium of culture.
   (c) Learned through imitation.
   (d) Acquired through discovery play.

3. What term best describes the process in which adults help a child's learning?
   (a) Scaffolding.
   (b) Laddering.
   (c) Zoning.
   (d) Bricking.

4. Which of the following educational techniques is closely linked to Vygotsky's theory?
   (a) Discovery learning.
   (b) Peer tutoring.
   (c) Use of the cane.
   (d) Coursework.

5. Which of the following examples of scaffolding represents the highest level (greatest amount) of help?
   (a) General prompts.
   (b) Indication of materials.
   (c) Demonstration.
   (d) Specific instructions.

Baillargeon's explanation of infant abilities

1. Which of Piaget's major ideas did Baillargeon particularly challenge?
   (a) Egocentrism.
   (b) Object permanence.
   (c) Class inclusion.
   (d) Formal reasoning.

2. Baillargeon's physical reasoning system is best described as:
   (a) Fully developed at birth.
   (b) Non-existent at birth and learned through experience.
   (c) Present at birth but refined through experience.
   (d) Not present at birth but acquired through maturation.

3. In Baillargeon's VOE research:
   (a) Babies looked for longer at expected events.
   (b) Babies looked for an equal time at expected and unexpected events.
   (c) Babies looked for longer at unexpected events.
   (d) Babies did not look at all at unexpected events.

4. Which of the following is an example of violation of expectation?
   (a) A short object passing behind a screen does not appear at a window.
   (b) A tall object passing behind a screen does not appear at a window.
   (c) An unsupported object falls to the floor.
   (d) An object is placed in a container and is there when it is opened.

5. Which of the following is a valid criticism of Baillargeon's theory?
   (a) Acting in accordance with a principle is not the same as understanding it.
   (b) Baillargeon cannot explain why physical understanding is universal.
   (c) Baillargeon's tests for infant reasoning are less valid than Piaget's.
   (d) The PRS is not consistent with what we know about other infant abilities.



Social cognition: Selman's levels of perspective-taking

1. Perspective-taking is most closely related to which of Piaget's research topics?
   (a) Conservation.
   (b) Egocentrism.
   (c) Object permanence.
   (d) Class inclusion.

2. At which of Selman's stages do children first take the perspective of another?
   (a) Socially egocentric.
   (b) Social-informational.
   (c) Self-reflective.
   (d) Mutual.

3. Which of the following is *not* one of Selman's additional aspects of social development?
   (a) Interpersonal understanding.
   (b) Interpersonal negotiation.
   (c) Awareness of personal meanings.
   (d) Theory of mind.

4. A legitimate criticism of Selman's theory is:
   (a) Overly cognitive.
   (b) Lack of evidence for developing perspective-taking.
   (c) Lack of reliability in the VOE method.
   (d) Lack of practical applications.

5. Which of the following children are likely to have problems with perspective-taking?
   (a) Children with a diagnosis of ADHD.
   (b) Autistic children.
   (c) Children under the age of six years.
   (d) All of the above.

Social cognition: Theory of mind

1. A research technique used to study theory of mind in children aged 18 months is:
   (a) False belief tasks.
   (b) Intentional reasoning tasks.
   (c) The Eyes Task.
   (d) The three mountains task.

2. At what age did Wimmer and Perner find most children could succeed in their false belief task?
   (a) 2 years.
   (b) 3 years.
   (c) 4 years.
   (d) 5 years.

3. What percentage of children in the autistic group succeeded in Baron-Cohen *et al.*'s Sally–Anne task?
   (a) 20%.
   (b) 50%.
   (c) 80%.
   (d) 85%.

4. In which of the following abilities do autistic people outperform neurotypicals?
   (a) Theory of mind.
   (b) Perspective-taking.
   (c) Social imagination.
   (d) Visual attention.

5. At the end of the Sally–Anne task:
   (a) Only Sally knows where the marble is.
   (b) Only Anne knows where the marble is.
   (c) They both know where the marble is.
   (d) Neither of them know where the marble is.

Social cognition: The mirror neuron system

1. Mirror neurons are believed to be what type of cell?
   (a) Glial cells.
   (b) Motor neurons.
   (c) Sensory neurons.
   (d) Interneurons.

2. Which features of autism might be explained by a 'faulty' mirror neuron system?
   (a) Weak theory of mind.
   (b) Highly developed systematic reasoning.
   (c) Superior visual attention.
   (d) Reliance on routine.

3. Which of the following do mirror neurons appear to be involved in?
   (a) Imitation.
   (b) Judging intentions.
   (c) Perspective-taking.
   (d) All of the above.

4. What method did Haker *et al.* use to study mirror neuron activity?
   (a) Autopsy.
   (b) EEG.
   (c) Brain scanning.
   (d) Deep brain stimulation.

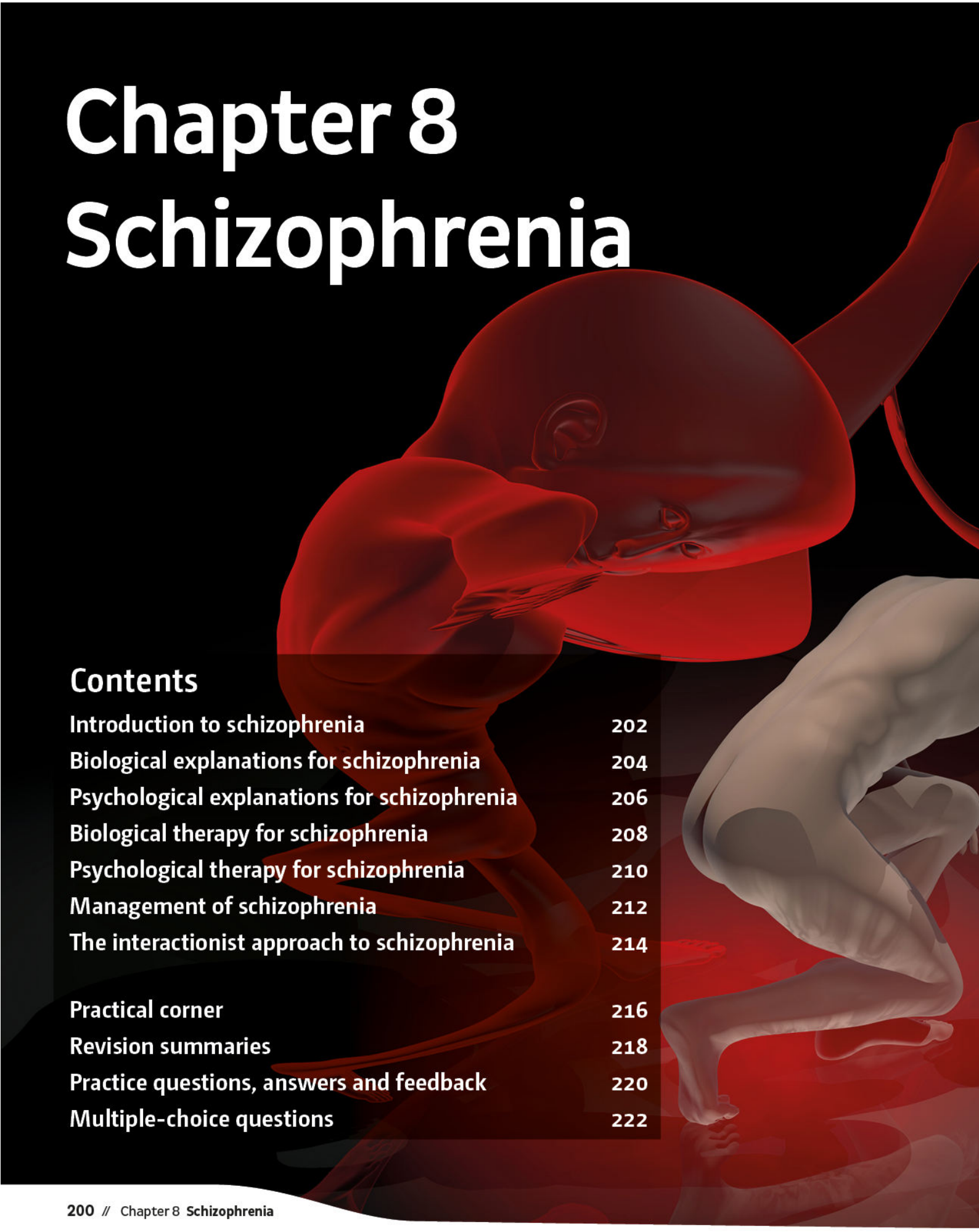
5. Mirror neurons have been used to explain:
   (a) Well-coordinated motor skills.
   (b) Contagious yawning.
   (c) Artistic abilities.
   (d) Sneezing.



MCQ answers

Piaget's theory of cognitive development 1A, 2C, 3B, 4D, 5B
Piaget's stages of intellectual development 1B, 2A, 3B, 4C, 5A
Vygotsky's theory of cognitive development 1C, 2B, 3A, 4B, 5C
Baillargeon's explanation of infant abilities 1B, 2C, 3C, 4B, 5A
Social cognition: Selman's levels of perspective taking 1B, 2B, 3D, 4A, 5D
Social cognition: Theory of mind 1B, 2C, 3A, 4D, 5B
Social cognition: The mirror neuron system 1B, 2A, 3D, 4C, 5B

Chapter 8 Schizophrenia



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From *The Voice*, by Sarah Teasdale

The living thoughts in me
Spring from dead men and women,
Forgotten time out of mind
And many as bubbles of foam.

Here for a moment's space
Into the light out of darkness,
I come and they come with me
Finding words with my breath.

Introduction to schizophrenia

The specification says...

Classification of schizophrenia. Positive symptoms of schizophrenia, including hallucinations and delusions. Negative symptoms of schizophrenia, including speech poverty and avolition.

Reliability and validity in diagnosis and classification of schizophrenia, including reference to co-morbidity, culture and gender bias and symptom overlap.

This spread is concerned with the symptoms and diagnosis of schizophrenia. There are many issues surrounding the diagnosis of schizophrenia, including its reliability and validity.

Key terms

Classification of mental disorder The process of organising symptoms into categories based on which symptoms frequently cluster together.

Schizophrenia A severe mental disorder where contact with reality and insight are impaired, an example of psychosis.

Positive symptoms of schizophrenia Atypical symptoms experienced *in addition to* normal experiences. They include hallucinations and delusions.

Hallucinations A positive symptom of schizophrenia. They are sensory experiences that have either no basis in reality or are distorted perceptions of things that are there.

Delusions A positive symptom of schizophrenia. They involve beliefs that have no basis in reality, for example, a person believes that they are someone else or that they are the victim of a conspiracy.

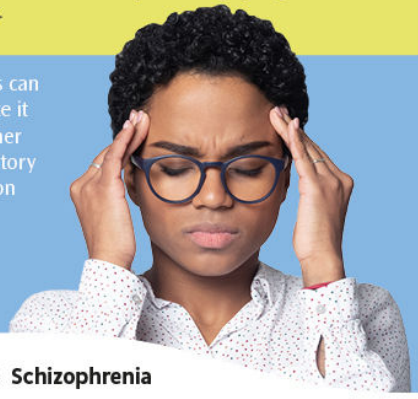
Negative symptoms of schizophrenia Atypical experiences that represent the *loss* of a usual experience such as a loss of clear thinking or a loss of motivation.

Speech poverty A negative symptom of schizophrenia. It involves reduced frequency and quality of speech.

Avolition A negative symptom of schizophrenia. It involves loss of motivation to carry out tasks and results in lowered activity levels.

Co-morbidity The occurrence of two disorders or conditions together, for example a person has both schizophrenia and a personality disorder. Where two conditions are frequently diagnosed together it calls into question the validity of classifying the two disorders separately.

Symptom overlap Occurs when two or more conditions share symptoms. Where conditions share many symptoms this calls into question the validity of classifying the two disorders separately.



Auditory hallucinations can be distracting and make it difficult to focus on other tasks requiring an auditory channel like speaking on a phone.

Diagnosis and classification of schizophrenia

Schizophrenia is a serious mental disorder experienced by about 1% of the world population. It is more commonly diagnosed in men, city-dwellers and lower socio-economic groups. The symptoms of schizophrenia can interfere severely with everyday tasks, so that many people with schizophrenia end up homeless or hospitalised.

Diagnosis and classification

Diagnosis and classification are interlinked. According to the medical approach, in order to diagnose a specific disorder, we need to distinguish one disorder from another. We do this by identifying clusters of symptoms that occur together and classifying this as one disorder. Diagnosis is then possible by identifying symptoms and deciding what disorder a person has (e.g. OCD, schizophrenia etc.).

The two major systems for the **classification of mental disorder**, are the World Health Organisation's *International Classification of Disease* (**ICD-10**, version 11 has been published but won't be used for diagnosis until 2022) and the American Psychiatric Association's *Diagnostic and Statistical Manual* edition 5 (**DSM-5**). These differ slightly in their classification of schizophrenia. For example, in the DSM-5 system one of the so-called **positive symptoms** must be present for diagnosis whereas two or more **negative symptoms** are sufficient under ICD.

Previous editions of ICD and DSM recognised subtypes of schizophrenia (e.g. paranoid schizophrenia involved mainly powerful hallucinations and delusions). Both DSM-5 and ICD-10 have dropped subtypes because they tended to be inconsistent e.g. someone with a diagnosis of paranoid schizophrenia would not necessarily show the same symptoms a few years later.

Positive symptoms

Positive symptoms of schizophrenia are additional experiences beyond those of ordinary existence. They include **hallucinations** and **delusions**.

Hallucinations These are unusual sensory experiences. Some hallucinations are related to events in the environment whereas others bear no relationship to what the senses are picking up from the environment, for example, voices heard either talking to or commenting on a person, often criticising them. Hallucinations can be experienced in relation to any sense. The person may, for example, see distorted facial expressions or occasionally people or animals that are not there.

Delusions Also known as paranoia, delusions are irrational beliefs. These can take a range of forms. Common delusions involve being an important historical, political or religious figure, such as Jesus or Napoleon. Delusions also commonly involve being persecuted, perhaps by government or aliens or of having superpowers. Another class of delusions concerns the body. A person may believe that they are under external control. Delusions can make a person behave in ways that make sense to them but seem bizarre to others.

Negative symptoms

Negative symptoms of schizophrenia involve the loss of usual abilities and experiences. Examples include **speech poverty** and **avolition**.

Speech poverty Schizophrenia is characterised by changes in patterns of speech. Speech poverty is seen as a negative symptom because the emphasis is on reduction in the amount and quality of speech in schizophrenia. This is sometimes accompanied by a delay in the person's verbal responses during conversation.

Nowadays, however, more emphasis is placed on speech *disorganisation* in which speech becomes incoherent or the speaker changes topic mid-sentence. This is classified in DSM-5 as a positive symptom of schizophrenia, whilst speech poverty remains a negative symptom.

Avolition Sometimes called 'apathy', this can be described as finding it difficult to begin or keep up with goal-directed activity, i.e. actions performed in order to achieve a result. People with schizophrenia often have sharply reduced motivation to carry out a range of activities. Nancy Andreasen (1982) identified three signs of avolition: poor hygiene and grooming, lack of persistence in work or education and lack of energy.

Practical activity on page 216

Issues in diagnosis and classification

Good reliability

One strength of the diagnosis of schizophrenia is its **reliability**.

Reliability means consistency. A psychiatric diagnosis is said to be reliable when different diagnosing clinicians reach the same diagnosis for the same individual (**inter-rater reliability**) and when the same clinician reaches the same diagnosis for the same individual on two occasions (**test-retest reliability**). Prior to DSM-5, reliability for schizophrenia diagnosis was low but this has now improved. Flávia Osório *et al.* (2019) report excellent reliability for the diagnosis of schizophrenia in 180 individuals using the DSM-5. Pairs of interviewers achieved inter-rater reliabilty of +.97 and test-retest reliability of +.92.

This means that we can be reasonably sure that the diagnosis of schizophrenia is consistently applied.

Low validity

One limitation of the diagnosis of schizophrenia is its **validity**.

In general validity concerns whether we assess what we are trying to assess. One way to assess validity of a psychiatric diagnosis is **criterion validity**. Elie Cheniaux *et al.* (2009) had two psychiatrists independently assess the same 100 clients using ICD-10 and DSM-IV criteria and found that 68 were diagnosed with schizophrenia under the ICD system and 39 under DSM.

This suggests that schizophrenia is either over- or underdiagnosed according to the diagnostic system. Either way this suggests that criterion validity is low.

Counterpoint In the Osório *et al.* study reported above there was excellent agreement between clinicians when they used two measures to diagnose schizophrenia both derived from the DSM system.

This means that the criterion validity for diagnosing schizophrenia is actually good provided it takes place within a single diagnostic system.

Co-morbidity

Another limitation of schizophrenia diagnosis is its **co-morbidity** with other conditions.

If conditions occur together a lot of the time then this calls into question the validity of their diagnosis and classification because they might actually be a single condition. Schizophrenia is commonly diagnosed with other conditions. For example, one review found that about half of those diagnosed with schizophrenia also had a diagnosis of depression or substance abuse (see research by Buckley *et al.* on the right).

This is a problem for classification because it means schizophrenia may not exist as a distinct condition, and is a problem for diagnosis as at least some people diagnosed with schizophrenia may have unusual cases of conditions like depression.

Gender bias in diagnosis

A further limitation of schizophrenia diagnosis is the existence of **gender bias**.

Since the 1980s men have been diagnosed with schizophrenia more commonly than women (a ratio of 1.4:1, Fischer and Buchanan 2017). One possible explanation for this is that women are less vulnerable than men, perhaps because of genetic factors. However it seems more likely that women are underdiagnosed because they have closer relationships and hence get support (Cotton *et al.* 2009). This leads to women with schizophrenia often functioning better than men.

This underdiagnosis is a gender bias and means women may not therefore be receiving treatment and services that might benefit them.

Culture bias in diagnosis

A further limitation of schizophrenia diagnosis is the existence of **culture bias**.

Some symptoms of schizophrenia, particularly hearing voices, have different meanings in different cultures. For example in Haiti some people believe that voices actually are communications from ancestors. British people of African-Caribbean origin are up to nine times as likely to receive a diagnosis as white British people (Pinto and Jones 2008), although people living in African-Caribbean countries are not, ruling out a genetic vulnerability. The most likely explanation for this is culture bias in diagnosis of clients by psychiatrists from a different cultural background. This appears to lead to an overinterpretation of symptoms in black British people (Escobar 2012).

This means that British African-Caribbean people may be discriminated against by a culturally-biased diagnostic system.

Symptom overlap

A final limitation of schizophrenia diagnosis is **symptom overlap** with other conditions.

There is considerable overlap between the symptoms of schizophrenia and the symptoms of other conditions. For example, both schizophrenia and bipolar disorder involve positive symptoms (such as delusions) and negative symptoms (such as avolition). In terms of classification this suggests that schizophrenia and bipolar disorder may not be two different conditions but variations of a single condition. In terms of diagnosis it means that schizophrenia is hard to distinguish from bipolar disorder.

As with co-morbidity, symptom overlap means that schizophrenia may not exist as a distinct condition and that even if it does it is hard to diagnose. So both its classification and diagnosis are flawed.

Apply it Concepts — Sam's story

Sam has been referred to a psychiatrist because, amongst other things, he has told people that he heard his dead grandfather talking to him.

Questions

1. With reference to the terms 'positive symptoms' and 'hallucinations' explain why Sam might receive a diagnosis of schizophrenia.
2. How might issues of culture bias affect this potential diagnosis?



Artist Louis Wain developed schizophrenia. His drawings of a cat illustrate the progressive changes in his mental state as the disorder progressed.

Apply it Methods — Buckley *et al.*

According to Buckley *et al.*, 50% of individuals with a diagnosis of schizophrenia also have depression, 47% have a co-morbidity with substance abuse and for OCD it is 23%.

Questions

1. Estimate how many people from a sample of 1637 individuals with a diagnosis of schizophrenia also have OCD. (*1 mark*)
2. What is the ratio of individuals with co-morbid OCD to those with co-morbid substance abuse? (*2 marks*)

Check it

1. Explain what is meant by the 'positive symptoms of schizophrenia'. *[4 marks]*
2. Explain the term 'avolition'. *[2 marks]*
3. Discuss the issues of culture bias **and** gender bias in the diagnosis of schizophrenia. *[8 marks]*
4. Discuss reliability **and** validity in relation to the diagnosis **and/or** classification of schizophrenia. *[16 marks]*

Biological explanations for schizophrenia

The specification says...

Biological explanations for schizophrenia: genetics and neural correlates, including the dopamine hypothesis.

Many mental health professionals believe that schizophrenia is at least partly biological in origin. This spread is concerned with genetic vulnerability to schizophrenia and the possible role of neural correlates (the neurotransmitter dopamine). These two explanations are interrelated because, if schizophrenia is genetic, then those genes lead to biological differences such as abnormal levels of dopamine.

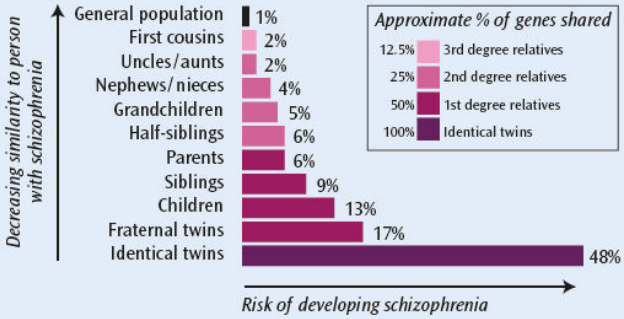
Key terms

Genetics Genes consist of DNA strands. DNA produces 'instructions' for general physical features of an organism (such as eye colour, height) and also specific physical features (such as neurotransmitter levels and size of brain structures). These may impact on psychological features (such as intelligence and mental disorder). Genes are transmitted from parents to offspring, i.e. inherited.

Neural correlates Patterns of structure or activity in the brain that occur in conjunction with an experience and may be implicated in the origins of that experience.

Dopamine A neurotransmitter that generally has an excitatory effect and is linked to the sensation of pleasure. Unusually high levels are associated with schizophrenia and unusually low levels are associated with Parkinson's disease.

As genetic similarity increases so does the probability of sharing schizophrenia. Source: Gottesman (1991)



Apply it Concepts

Gene's genes

Gene and his partner Kary are considering having children. However, Gene is concerned that, as his own father has had schizophrenia for many years, he may pass on 'the gene' for schizophrenia to his own children. Gene and Kary attend genetic counselling in order to learn about the risks of their children developing schizophrenia.

Questions

1. What is the probability of Gene and Kary's child developing schizophrenia?
2. What might the genetic counsellor tell them about their understanding of 'the gene' for schizophrenia?

The genetic basis of schizophrenia

Family studies

Family studies have confirmed that risk of **schizophrenia** increases in line with **genetic** similarity to a relative with the disorder. This relationship is shown in the graph below left, which presents the findings from Irving Gottesman's (1991) large-scale family study. For example someone with an aunt with schizophrenia has a 2% chance of developing it, increasing to 9% if the individual is a sibling and 48% if they are an identical twin.

Of course family members tend to share aspects of their environment as well as many of their genes, so the **correlation** represents both – but family studies still give good support for the importance of genes in schizophrenia.

Candidate genes

The next logical step is to identify **candidate genes**. Early research in this area looked for a single genetic variation in the belief that one faulty gene could explain schizophrenia.

However, it appears that a number of different genes are involved, i.e. schizophrenia is **polygenic**. The most likely genes would be those coding for **neurotransmitters** including **dopamine** (see the dopamine hypothesis, below).

In one particularly large study Stephen Ripke *et al.* (2014) combined all previous data from genome-wide studies (i.e. those looking at the whole human genome as opposed to particular genes) of schizophrenia. The genetic make-up of 37,000 people with a diagnosis of schizophrenia was compared to that of 113,000 controls, 108 separate genetic variations were associated with slightly increased risk of schizophrenia.

Because different studies have identified different candidate genes it also appears that schizophrenia is **aetiologically heterogeneous**, i.e. different combinations of factors, including genetic variation, can lead to the condition.

The role of mutation

Schizophrenia can also have a genetic origin in the absence of a family history of the disorder. One explanation for this is mutation in parental DNA which can be caused by radiation, poison or viral infection.

Evidence for mutation comes from positive correlations between paternal age (associated with increased risk of sperm mutation) and risk of schizophrenia, increasing from around 0.7% with fathers under 25 to over 2% in fathers over 50 (Brown *et al.* 2002).

Neural correlates of schizophrenia

We do not know exactly what causes the symptoms of schizophrenia on a biological level, however research has identified some **neural correlates** i.e. a brain structure or function. The best-known neural correlate of schizophrenia is the neurotransmitter **dopamine** (DA). It is important in the functioning of several brain systems related to the symptoms of schizophrenia.

The original dopamine hypothesis

The original hypothesis was based on the discovery that drugs used to treat schizophrenia (**antipsychotics**, which reduce DA) caused symptoms similar to those in people with **Parkinson's disease**, a condition associated with low DA levels (Seeman 1987). Therefore schizophrenia might be the result of *high* levels of DA (*hyper*dopaminergia, 'hyper' means 'high') in **subcortical** areas of the brain. For example, an excess of DA receptors in pathways from the subcortex to **Broca's area** (responsible for speech production) may explain specific symptoms of schizophrenia such as poverty of speech and/or auditory hallucinations.

Updated versions of the dopamine hypothesis

Kenneth Davis *et al.* (1991) proposed the addition of cortical *hypo*dopaminergia i.e. abnormally *low* DA in the brain's **cortex**. This too can explain symptoms of schizophrenia. For example low DA in the **prefrontal cortex** (responsible for thinking) could explain cognitive problems i.e. negative symptoms of schizophrenia. It has also been suggested that cortical *hypo*dopaminergia leads to subcortical *hyper*dopaminergia – so both high and low levels of DA in different brain regions are part of the updated version.

As well as explaining the links between abnormal DA levels and symptoms, current versions of the dopamine hypothesis try to explain the origins of abnormal DA function. So it seems that both genetic variations (see above) and early experiences of stress, both psychological and physical, make some people more sensitive to cortical hypodopaminergia and hence subcortical hyperdopaminergia (Howes *et al.* 2017).

Evaluation

Research support

One strength of the genetic explanation is the strong evidence base.

Family studies such as Gottesman (facing page) show that risk increases with genetic similarity to a family member with schizophrenia. Adoption studies such as Pekka Tienari *et al.* (2004), show that biological children of parents with schizophrenia are at heightened risk even if they grow up in an adoptive family. A recent twin study by Rikke Hilker *et al.* (2018) showed a **concordance rate** of 33% for identical twins and 7% for non-identical twins.

This shows that some people are more vulnerable to schizophrenia as a result of their genetic make-up.

Environmental factors

One limitation of the genetic explanation is there is clear evidence to show that environmental factors also increase the risk of developing schizophrenia.

These environmental factors include both biological and psychological influences. Biological risk factors include birth complications (Morgan *et al.* 2017) and smoking THC-rich cannabis in teenage years (Di Forti *et al.* 2015). Psychological risk factors include childhood trauma which leaves people more vulnerable to adult mental health problems in general but there is now evidence for a particular link with schizophrenia. In one study by Nina Mørkved *et al.* (2017), 67% of people with schizophrenia and related **psychotic** disorders reported at least one childhood trauma as opposed to 38% of a **matched group** with non-psychotic mental health issues.

This means that genetic factors alone cannot provide a complete explanation for schizophrenia.

Evaluation eXtra

Genetic counselling

One application of our understanding of the likely role of genes in schizophrenia is genetic counselling. If one or more potential parents have a relative with schizophrenia, they risk having a child who would go on to develop the condition.

However the risk estimate provided by genetic counselling is just an average figure. It will not really reflect the probability of a particular child going on to develop schizophrenia because they will experience a particular environment which also has risk factors.

Consider: *Is genetic counselling helpful?*

Evaluation

Evidence for dopamine

One strength is support for the idea that dopamine (DA) is involved in schizophrenia.

First, amphetamines increase DA and worsen symptoms in people with schizophrenia and induce symptoms in people without (Curran *et al.* 2004). Second, antipsychotic drugs reduce DA activity and also reduce the intensity of symptoms (Tauscher *et al.* 2014). Third, some candidate genes act on the production of DA or DA receptors.

This strongly suggests that dopamine is involved in the symptoms of schizophrenia.

Glutamate

One limitation of the dopamine hypothesis is evidence for a central role of glutamate.

Post-mortem and live **scanning** studies have consistently found raised levels of the neurotransmitter glutamate in several brain regions of people with schizophrenia (McCutcheon *et al.* 2020). In addition, several candidate genes for schizophrenia are believed to be involved in glutamate production or processing.

This means that an equally strong case can be made for a role for other neurotransmitters.

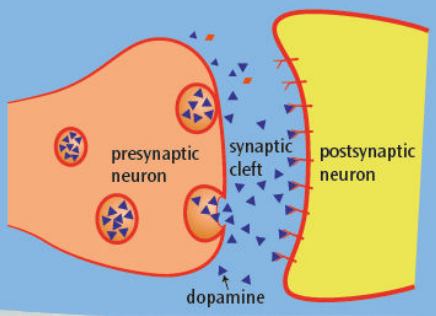
Evaluation eXtra

Amphetamine psychosis

Catherine Tenn *et al.* (2003) induced schizophenia-like symptoms in rats using amphetamines and then relieved symptoms using drugs that reduce DA action. This supports the dopamine hypothesis.

However, other drugs that also increase DA levels (e.g. apomorphine) do not cause schizophrenia-like symptoms (Dépatie and Lal 2001). Also, Justin Garson (2017) has challenged the idea that amphetamine psychosis closely mimics schizophrenia.

Consider: *Does amphetamine psychosis support the dopamine hypothesis?*



The action of dopamine at a synapse. This appears to be disrupted in schizophrenia.

Apply it Concepts

Parkinson's and the dopamine hypothesis

Parkinson's disease is a degenerative condition in which cells in a region of the brain called the *substantia nigra* die, resulting in a reduction in dopamine levels. This in turn affects the brain's ability to control movement. Parkinson's is treated with drugs that help the brain produce more dopamine. However, these drugs worsen the symptoms of schizophrenia.

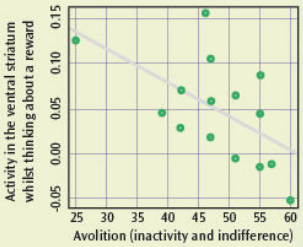
Questions

1. What does this suggest about the dopamine hypothesis as an explanation for schizophrenia?
2. Now imagine that a new drug for treating Parkinson's also worked by raising dopamine levels only in the cortex, and that this *reduced* the symptoms of schizophrenia. What would this suggest about the dopamine hypothesis?

Apply it Methods

A correlation

This graph shows the correlation between avolition and activity in the brain's reward system in people with schizophrenia (from Simon *et al.* 2015).



Questions

1. Estimate the **correlation coefficient** shown in the graph. (*2 marks*)
2. Explain what this graph shows. (*2 marks*)
3. What **statistical test** would you use to test the significance of these results? Explain the reasons for your choice. (*3 marks*)

Check it

1. Explain the role of genetics in the development of schizophrenia. *[4 marks]*
2. Evaluate the role of genetics in the development of schizophrenia. *[8 marks]*
3. Outline what is meant by 'neural correlates'. *[2 marks]*
4. Discuss the dopamine hypothesis. *[8 marks]*
5. Describe **and** evaluate biological explanations for schizophrenia. *[16 marks]*

Psychological explanations for schizophrenia

The specification says...

Psychological explanations for schizophrenia: family dysfunction and cognitive explanations, including dysfunctional thought processing.

Although there is little doubt that biological processes are important in both the origins and symptoms of schizophrenia, this does not mean that psychological processes are not also important. There are a range of psychological explanations for schizophrenia. Some of these have focused on the psychological environment, in particular the family, and its role in making individuals particularly vulnerable to schizophrenia. Others have focused more on the mind and emphasising the role of distorted cognitions in the experience of schizophrenia.

Key terms

Family dysfunction Refers to processes within a family such as poor family communication, cold parenting and high levels of expressed emotion. These may be risk factors for both the development and maintenance of schizophrenia.

Cognitive explanations Explanations that focus on mental processes such as thinking, language and attention.

Dysfunctional thought processing Information processing that does not represent reality accurately and produces undesirable consequences.

Apply it Concepts Raj

Raj has been diagnosed with schizophrenia, and his parents and psychiatrist are planning for his release from a psychiatric hospital.

Raj's parents are worried that he won't cope living on his own but if he lives with them, they will have to make certain sacrifices. They point to Raj's record of coping without them in the past.

Question

Raj's psychiatrist thinks that there may be issues with dysfunctional family functioning. Explain why the psychiatrist may draw this conclusion.



The schizophrenogenic mother is cold and rejecting.

Family dysfunction

Psychologists have attempted to link **schizophrenia** to childhood and adult experiences of living in a dysfunctional family (**family dysfunction**).

The schizophrenogenic mother

Psychiatrist Frieda Fromm-Reichmann (1948) proposed a **psychodynamic** explanation for schizophrenia based on the accounts she heard from her patients about their childhoods. Fromm-Reichmann noted that many of her patients spoke of a particular type of parent, which she called the **schizophrenogenic mother**. 'Schizophrenogenic' literally means 'schizophrenia-causing'. According to Fromm-Reichmann the schizophrenogenic mother is cold, rejecting and controlling, and tends to create a family climate characterised by tension and secrecy. This leads to distrust that later develops into paranoid delusions (i.e. beliefs of being persecuted by another person), and ultimately schizophrenia.

Double-bind theory

Gregory Bateson *et al.* (1972) agreed that family climate is important in the development of schizophrenia but emphasised the role of communication style within a family. The developing child regularly finds themselves trapped in situations where they fear doing the wrong thing, but receive mixed messages about what this is, and feel unable to comment on the unfairness of this situation or seek clarification. When they 'get it wrong' (which is often) the child is punished by withdrawal of love. This leaves them with an understanding of the world as confusing and dangerous, and this is reflected in symptoms like disorganised thinking and paranoid delusions. Bateson was clear that this was neither the main type of communication in the family of someone with schizophrenia nor the only factor in developing schizophrenia, just a risk factor.

Expressed emotion

Expressed emotion (or EE) is the level of emotion, in particular negative emotion, expressed towards a person with schizophrenia by their carers who are often family members. EE contains several elements:

- Verbal criticism of the person, occasionally accompanied by violence.
- Hostility towards the person, including anger and rejection.
- Emotional overinvolvement in the life of the person, including needless self-sacrifice.

These high levels of expressed emotion directed towards the individual are a serious source of stress for them. This is primarily an explanation for relapse in people with schizophrenia. However, it has also been suggested that it may be a source of stress that can trigger the onset of schizophrenia in a person who is already vulnerable, for example, due to their genetic make-up (the **diathesis-stress model** discussed fully on page 214).

Cognitive explanations

Dysfunctional thinking

A **cognitive explanation** for any phenomenon is one which focuses on the role of mental processes. Schizophrenia is associated with several types of **dysfunctional thought processing**, and these can provide possible explanations for schizophrenia as a whole.

Schizophrenia is characterised by disruption to normal thought processing. We can see this in many of its symptoms. Reduced thought processing in the **ventral striatum** is associated with negative symptoms, whilst reduced processing of information in the **temporal** and **cingulate gyri** is associated with **hallucinations** (Simon *et al.* 2015, see graph in Apply it on previous spread). This lower-than-usual level of information processing suggests that cognition is likely to be impaired.

Metarepresentation dysfunction

Christopher Frith *et al.* (1992) identified two kinds of dysfunctional thought processes. The first is metarespresentation, the cognitive ability to reflect on thoughts and behaviour. This allows us insight into our own intentions and goals. It also allows us to interpret the actions of others. Dysfunction in metarepresentation would disrupt our ability to recognise our own actions and thoughts as being carried out by ourselves rather than someone else. This would explain hallucinations of hearing voices and delusions like thought insertion (the experience of having thoughts projected into the mind by others).

Central control dysfunction

Frith *et al.* also identified issues with the cognitive ability to suppress automatic responses while we perform deliberate actions. Speech poverty and thought disorder could result from the inability to suppress automatic thoughts and speech triggered by other thoughts. For example, people with schizophrenia tend to experience derailment of thoughts because each word triggers associations, and the person cannot suppress automatic responses to these.

Practical activity (using a cognitive task) on page 217

Evaluation

Research support

One strength of these explanations is evidence linking family dysfunction to schizophrenia.

Indicators of family dysfunction include **insecure attachment** and exposure to childhood trauma, especially abuse. According to a review by John Read *et al.* (2005) adults with schizophrenia are disproportionately likely to have insecure attachment, particularly Type C or D. Read *et al.* also reported that 69% of women and 59% of men with schizophrenia have a history of physical and/or sexual abuse. In the Mørkved *et al.* (2017) study, on the previous spread, most adults with schizophrenia reported at least one childhood trauma, mostly abuse.

This strongly suggests that family dysfunction makes people more vulnerable to schizophrenia.

Explanations lack support

One limitation of family explanations is the poor evidence base for any of the explanations.

Although there is plenty of evidence supporting the idea that childhood family-based stress is associated with adult schizophrenia, there is almost none to support the importance of traditional family-based theories such as the schizophrenogenic mother and double bind. Both these theories are based on clinical observation of people with schizophrenia and also informal assessment of their mothers' personalities, but not systematic evidence.

This means that family explanations have not been able to account for the link between childhood trauma and schizophrenia.

Evaluation eXtra

Parent-blaming

Although early explanations for the family–schizophrenia link have no research support, research in this area may be useful in showing that insecure attachment and experience of childhood trauma affect individual vulnerability to schizophrenia.

On the other hand, research linking family dysfunction to schizophrenia is highly socially sensitive because it can lead to parent-blaming. Mothers seem to be particularly blamed. For parents already having to watch their child experience the symptoms of schizophrenia and take responsibility for their care, to be blamed literally adds insult to injury.

Consider: *Should psychologists continue with this line of research?*

Evaluation

Research support

One strength of cognitive explanations is evidence for dysfunctional thought processing.

John Stirling *et al.* (2006) compared performance on a range of cognitive tasks in 30 people with schizophrenia and a control group of 30 people without schizophrenia. Tasks included the Stroop task (see right), in which participants have to name the font-colours of colour-words, so have to suppress the tendency to read the words aloud. As predicted by Frith *et al.*'s central control theory, people with schizophrenia took longer – over twice as long on average – to name the font-colours.

This means that the cognitive processes of people with schizophrenia are impaired.

A proximal explanation

One limitation of cognitive explanations is that they only explain the **proximal** origins of symptoms.

Cognitive explanations for schizophrenia are proximal explanations because they explain what is happening *now* to produce symptoms – as distinct from distal explanations which focus on what initially caused the condition. Possible distal explanations are genetic and family dysfunction explanations. What is currently unclear and not well-addressed is how genetic variation or childhood trauma might lead to problems with metarepresentation or central control.

This means that cognitive theories on their own only provide partial explanations for schizophrenia.

Evaluation eXtra

Psychological or biological?

The cognitive approach provides an excellent explanation for the symptoms of schizophrenia. There is therefore an argument for seeing schizophrenia primarily as a psychological condition.

On the other hand, it appears that the abnormal cognition associated with schizophrenia is partly genetic in origin and the result of abnormal brain development (Toulopoulou *et al.* 2019). This would suggest that schizophrenia is a biological condition.

Consider: *Is schizophrenia best seen as a psychological or biological condition?*

Apply it Concepts — Speech poverty

Melanie is having a psychiatric assessment after reporting to her GP that she is hearing voices and believes that someone else is projecting thoughts into her mind. During the interview Melanie finds it hard to keep her attention on what she is saying and frequently her conversation goes off 'on a tangent'. The psychiatrist notes this as 'derailment'.

Question

How might the psychiatrist explain each of these symptoms using the idea of dysfunctional thought processing?

Apply it Methods — Stirling *et al.*

Stirling *et al.* (see bottom left) studied the performance of people with schizophrenia and a control group of people with no diagnosis on the Stroop task. The results are shown below.

Time (s)	Mean	Standard deviation
Schizophrenia	123.20	65.52
Control	58.12	11.26

Questions

1. What is meant by **standard deviation**? (*2 marks*)
2. What do the standard deviations in this table of results show? (*2 marks*)
3. Taken together with the **mean**, what do the results tell us? (*2 marks*)
4. Explain *one* strength of using the standard deviation over other **measures of dispersion**. (*2 marks*)

People with schizophrenia typically find the Stroop task challenging, where you are required to name the colour that the word is written in (see text), suggesting difficulty in suppressing automatic processing.

RED YELLOW GREEN
ORANGE BLUE GREEN
YELLOW BLUE RED
ORANGE RED GREEN
RED YELLOW GREEN
ORANGE BLUE GREEN
YELLOW BLUE RED
ORANGE RED GREEN

Check it

1. Outline what is meant by 'dysfunctional thought processing'. *[3 marks]*
2. Evaluate family dysfunction as an explanation for schizophrenia. *[8 marks]*
3. Explain **one** limitation of cognitive explanations as an explanation of schizophrenia. *[4 marks]*
4. Describe **and** evaluate psychological theories of schizophrenia. *[16 marks]*

Biological therapy for schizophrenia

The specification says...

Drug therapy: typical and atypical antipsychotics.

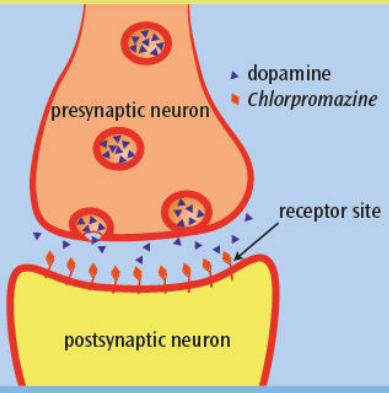
This spread is concerned with antipsychotic medication. This is the most commonly used treatment for schizophrenia. Antipsychotic drugs can be split into older typical antipsychotics and newer atypical antipsychotics.

Key terms

Antipsychotics Drugs used to reduce the intensity of symptoms, in particular the positive symptoms, of psychotic disorders like schizophrenia.

Typical antipsychotics The first generation of drugs for schizophrenia and other psychotic disorders, having been used since the 1950s. They work as dopamine antagonists and include *chlorpromazine*.

Atypical antipsychotics Drugs for schizophrenia (a psychotic disorder) developed after typical antipsychotics. They typically target a range of neurotransmitters such as dopamine and serotonin. Examples include *clozapine* and *risperidone*.



Chlorpromazine acts as a dopamine antagonist, i.e. it acts against dopamine, in this case by blocking dopamine receptors at the postsynaptic neuron.

Apply it

Concepts

Explaining it to Brendan

Brendan has recently been diagnosed with schizophrenia with accompanying depression and suicidal thoughts. Brendan is a scientist and is curious about how antipsychotics work. He is also curious about his psychiatrist's choice of *clozapine* as his antipsychotic medication.

Questions

1. How might Brendan's psychiatrist explain the effects of antipsychotics? Refer to the dopamine hypothesis in your answer.
2. Why might Brendan's psychiatrist have prescribed *clozapine*?

Drug therapy

The most common treatment for **schizophrenia** involves the use of **antipsychotic** drugs. The term 'antipsychotic' refers to psychosis. A person with psychosis experiences some loss of contact with reality, for example through hallucinations or delusions. Psychosis is a defining characteristic of schizophrenia and related disorders.

Antipsychotics may be required in the short or long term. Some people can take a short course of antipsychotics then stop their use without the return of symptoms. Other people may require antipsychotics for life or else face the likelihood of a recurrence of schizophrenia. Antipsychotics can be divided into **typical** (traditional) and newer **atypical** or second-generation drugs.

Typical antipsychotics

Typical antipsychotics have been around since the 1950s and include *chlorpromazine* which can be taken as tablets, syrup or by injection. If taken orally it is administered daily up to a maximum of 1000 mg, although initially doses are much smaller and for most people the dosage is gradually increased to a maximum of 400 to 800 mg. Typical prescribed doses have declined over the last 50 years (Liu and de Haan 2009).

Dopamine antagonists There is a strong association between the use of typical antipsychotics like *chlorpromazine* and the **dopamine hypothesis**. Typical antipsychotics like *chlorpromazine* work by acting as **antagonists** in the dopamine system. Antagonists are chemicals which reduce the action of a **neurotransmitter**. Dopamine antagonists work by blocking dopamine receptors in the synapses of the brain, reducing the action of dopamine. Initially when an individual begins taking *chlorpromazine* dopamine levels build up, but then its production is reduced. According to the dopamine hypothesis of schizophrenia this dopamine-antagonist effect normalises neurotransmission in key areas of the brain, reducing symptoms like **hallucinations**.

Sedation effect As well as having antipsychotic properties *chlorpromazine* is also an effective sedative. This is believed to be related to its effect on histamine receptors but it is not fully understood how this leads to sedation. *Chlorpromazine* is often used to calm individuals not only with schizophrenia but also with other conditions. This has often been done when patients are first admitted to hospitals and are very anxious. Syrup is absorbed faster than tablets so it tends to be given when *chlorpromazine* is used for its sedative properties.

Atypical antipsychotics

Atypical antipsychotics have been used since the 1970s. The aim in developing newer antipsychotics was to maintain or improve upon the effectiveness of drugs in suppressing the symptoms of psychosis and also minimise the side effects of the drugs used. There are a range of atypical antipsychotics and they do not all work in the same way. In fact we do not know how some of them work.

Clozapine *Clozapine* was developed in the 1960s and first trialled in the early 1970s. It was withdrawn for a while in the 1970s following the deaths of some patients from a blood condition called *agranulocytosis*. However, in the 1980s, when it was discovered to be more effective than typical antipsychotics, *clozapine* was remarketed as a treatment for schizophrenia to be used when other treatments failed. It is still used in this way today, and people taking it have regular blood tests to ensure they are not developing agranulocytosis. Because of its potentially fatal side effects *clozapine* is not available as an injection. Daily dosage is a little lower than for *chlorpromazine*, typically 300 to 450 mg a day.

Clozapine binds to dopamine receptors in the same way that *chlorpromazine* does, but in addition it acts on **serotonin** and **glutamate** receptors. It is believed that this action helps improve mood and reduce **depression** and anxiety in patients, and that it may improve cognitive functioning. The mood-enhancing effects of *clozapine* mean that it is sometimes prescribed when an individual is considered at high risk of suicide. This is important as 30 to 50% of people with schizophrenia attempt suicide at some point.

Risperidone *Risperidone* is a more recently developed atypical antipsychotic, having been around since the 1990s. It was developed in an attempt to produce a drug as effective as *clozapine* but without its serious side effects. Like *chlorpromazine*, *risperidone* can be taken in the form of tablets, syrup or an injection that lasts for around two weeks. In common with other antipsychotics a small dose is initially given and this is built up to a typical daily dose of 4–8 mg and a maximum of 12 mg.

Like *clozapine*, *risperidone* is believed to bind to dopamine and serotonin receptors. *Risperidone* binds more strongly to dopamine receptors than *clozapine* and is therefore effective in much smaller doses than most antipsychotics. There is some evidence to suggest that this leads to fewer side effects than other antipsychotics.

Evaluation

Evidence for effectiveness

One strength of antipsychotics is evidence to support their effectiveness.

There is a large body of evidence to support the idea that both typical and atypical antipsychotics are at least moderately effective in tackling the symptoms of schizophrenia. Ben Thornley *et al*. (2003) reviewed studies comparing the effects of *chlorpromazine* to **control conditions**. Data from 13 trials with a total of 1121 participants showed that *chlorpromazine* was associated with better overall functioning and reduced symptom severity as compared to **placebo**. There is also evidence for the benefits of atypical antipsychotics. In a review Herbert Meltzer (2012) concluded that *clozapine* is more effective than typical antipsychotics and other atypical antipsychotics, and that it is effective in 30–50% of treatment-resistant cases where typical antipsychotics have failed.

This means that, as far as we can tell, antipsychotics work.

Counterpoint David Healy (2012) has suggested serious flaws with evidence for effectiveness. For example most studies are of short-term effects only and some successful trials have had their data published multiple times, exaggerating the size of the evidence base for positive effects. Also, because antipsychotics have powerful calming effects, it is easy to demonstrate that they have some positive effect on people experiencing the symptoms of schizophrenia. This is not the same as saying they really reduce the severity of psychosis.

This means that the evidence base for antipsychotic effectiveness is less impressive than it first appears.

Serious side effects

One limitation of antipsychotic drugs is the likelihood of side effects.

Typical antipsychotics are associated with a range of side effects including dizziness, agitation, sleepiness, stiff jaw, weight gain and itchy skin. Long-term use can result in **tardive dyskinesia**, which is caused by dopamine supersensitivity and causes involuntary facial movements such as grimacing, blinking and lip-smacking. The most serious side effect of antipsychotics (particularly typical antipsychotics) is **neuroleptic malignant syndrome** (NMS). This is believed to be caused when the drug blocks dopamine action in the **hypothalamus**, an area in the brain associated with the regulation of a number of body systems. NMS results in high temperature, delirium and coma, and can be fatal. Estimates of its frequency range from less than 0.1% to just over 2%.

This means that antipsychotics can do harm as well as good and individuals who experience these may avoid such treatments (which makes the treatment ineffective).

Mechanism unclear

A further limitation of antipsychotics (typical and at least some atypical) is that we do not know why they work.

Our understanding of the mechanism by which antipsychotic drugs work is strongly tied up with the original dopamine hypothesis – the idea that symptoms of schizophrenia are linked to high levels of dopamine activity in the subcortex of the brain. However we now know that this original dopamine hypothesis is not a complete explanation for schizophrenia, and that in fact dopamine levels in other parts of the brain are too *low* rather than too high. If this is true then most antipsychotics should not work. Given that there are questions over the effectiveness of antipsychotics anyway this adds to the argument that in fact they are ineffective.

This means that at least some of the antipsychotics may not be the best treatment to opt for – perhaps some other factor is involved in their apparent success.

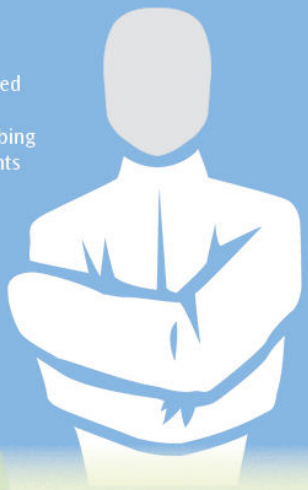
Evaluation eXtra

The chemical cosh

It is widely believed that antipsychotics have been used in hospital situations to calm people with schizophrenia and make them easier for staff to work with, rather than for the benefits to the people themselves (e.g. Moncrieff 2013).

On the other hand, calming people distressed by hallucinations and delusions almost certainly makes them feel better, and allows them to engage with other treatments (such as **cognitive behaviour therapy**) and services (such as meeting with a social worker to organise accommodation).

Consider: *Should antipsychotics be prescribed?*



Critics have compared antipsychotics to straitjackets, describing them as human rights violations.

Apply it
Methods

Clozapine

In outcome studies (which look at effectiveness of drugs) *clozapine* is estimated to be successful in 30–50% of cases where typical antipsychotics have failed.

Questions

1. Outcome studies like this generally use an **independent groups design**. Explain why this is a good idea. (*2 marks*)
2. If you were to design an experimental study to test the effects of *clozapine* on schizophrenia how could you control for **confounding variables**? (*3 marks*)
3. a) Explain what is meant by the term **demand characteristics**. (*2 marks*)
   b) How could you eliminate the effect of demand characteristics in this study? (*2 marks*)

Apply it
Concepts

Questioning antipsychotics

You are a mental health professional and a family friend of Cally. Cally has been prescribed antipsychotics, but is refusing to take them because she has heard that they have serious side effects and that they do not work.

Question

Cally's family ask your advice. What might you tell them about Cally's concerns?

Study tip

Don't shy away from using technical terms and concepts as they really contribute to the quality of your answers. You may wish to reread the spread on synaptic transmission (page 37) to fully understand the processes discussed on this spread.

Check it

1. Explain what is meant by an 'atypical antipsychotic' drug. *[2 marks]*
2. Outline the use of typical antipsychotics. *[6 marks]*
3. Explain the difference between typical and atypical antipsychotics. *[4 marks]*
4. Describe **and** evaluate antipsychotics as a treatment for schizophrenia. *[16 marks]*

Psychological therapy for schizophrenia

The specification says...

Cognitive behaviour therapy and family therapy as used in the treatment of schizophrenia.

This spread is concerned with two psychological approaches to treating schizophrenia. Both of the therapies discussed on this spread are related to the psychological explanations on page 206. The conventional wisdom has been that such therapies should be used alongside antipsychotic drugs.

Key terms

Cognitive behaviour therapy (CBT) A method for treating mental disorders based on both cognitive and behavioural techniques. From the cognitive viewpoint the therapy aims to deal with thinking, such as challenging negative thoughts. The therapy includes behavioural techniques.

Family therapy A psychological therapy carried out with all or some members of a family with the aim of improving the communications within the family and reducing the stress of living as a family.



Family therapy aims to reduce stress and expression of negative emotion in families.

Apply it

Concepts Bronwyn

Bronwyn has been an inpatient in her local psychiatric hospital for the last year. She was admitted with a diagnosis of schizophrenia after developing a strong belief that she was being controlled by the government. After a year of medication and a course of CBT her symptoms are now under control.

Questions

1. How might CBT have been used to help Bronwyn with her belief that she was being controlled by the government?
2. Why would medication have been used as well?

Cognitive behaviour therapy

Cognitive behaviour therapy (CBT) is commonly used to treat people with **schizophrenia**. It usually takes place over a period of 5–20 sessions (this is longer than for other conditions), either in groups or on an individual basis. CBT aims to deal with both thoughts (cognitions) and behaviour.

How cognitive behaviour therapy helps

CBT can help a client make sense of how their irrational cognitions (such as **delusions** and **hallucinations**) impact on their feelings and behaviour. Just understanding where symptoms come from can be hugely helpful for those with symptoms like auditory hallucinations. If, for example, a client hears voices and believes the voices represent demonic forces, they will naturally be very afraid. If a therapist can convince them that the voice actually comes from the malfunctioning speech centre in their own brain and that it cannot hurt them if they ignore it, this is much less frightening and hence less debilitating. This will not eliminate the symptoms of schizophrenia but it can make people better able to cope with them. This in turn reduces their distress and improves their ability to function adequately.

People hearing voices can also be helped by teaching them that voice-hearing is an extension of the ordinary experience of thinking in words. This is called *normalisation*. Delusions can also be challenged, for example by a process of reality testing in which the person with schizophrenia and their therapist jointly examine the likelihood that beliefs are true. In some cases where delusions are resistant to reality testing CBT can still be used to tackle the anxiety and depression that result from living with schizophrenia.

A case example

Douglas Turkington *et al.* (2004) describe an example of CBT used to challenge where a paranoid client's delusions come from:

Paranoid client: The Mafia are observing me to decide how to kill me.

Therapist: You are obviously very frightened . . . there must be a good reason for this.

Paranoid client: Do you think it's the Mafia?

Therapist: It's a possibility, but there could be other explanations. How do you know that it's the Mafia?

Family therapy

Family therapy takes place with families as well as the *identified patient* (a term used in family therapy which describes one member of a dysfunctional family who expresses the family's conflicts). The therapy aims to improve the quality of communication and interaction between family members. There is a range of approaches to family therapy for schizophrenia. In keeping with psychological theories like the **double-bind** and **the schizophrenogenic mother** (see page 206).

How family therapy helps

Fiona Pharoah *et al.* (2010) identified a range of strategies that family therapists use to try to improve the functioning of a family that has a member with schizophrenia.

Reduces negative emotions Family therapy aims to reduce levels of expressed emotion (EE), i.e. reduce the level of emotion generally but especially negative emotions such as anger and guilt which create stress. Reducing stress is important to reduce the likelihood of relapse.

Improves the family's ability to help The therapist encourages family members to form a therapeutic alliance whereby they all agree on the aims of therapy. The therapist also tries to improve families' beliefs about and behaviour towards schizophrenia. A further aim is to ensure that family members achieve a balance between caring for the individual with schizophrenia and maintaining their own lives.

A model of practice

Frank Burbach (2018) has proposed a model for working with families dealing with schizophrenia. This begins with sharing basic information and providing emotional and practical support. Then it develops through progressively deeper levels. Phase 2 involves identifying resources including what different family members can (and cannot) offer. Phase 3 aims to encourage mutual understanding, creating a safe space for all family members to express their feelings. Phase 4 involves identifying unhelpful patterns of interaction. Phase 5 is about skills training such as learning stress management techniques. Phase 6 looks at relapse prevention planning and Phase 7 is maintenance for the future.

Evaluation

Evidence of effectiveness

One strength of CBT for schizophrenia is the evidence for its effectiveness.

Sameer Jauhar *et al.* (2014) reviewed 34 studies of using CBT with schizophrenia, concluding that there is clear evidence for small but **significant** effects on both positive and negative symptoms. Other studies have focused on symptoms, for example Maria Pontillo *et al.* (2016) found reductions in frequency and severity of auditory hallucinations. Clinical advice from NICE (2019), the National Institute for Health and Care Excellence, recommends CBT for schizophrenia.

This means that both research and clinical experience support the benefits of CBT for schizophrenia.

Quality of evidence

One limitation of CBT for schizophrenia is the wide range of techniques and symptoms included in studies.

CBT techniques and schizophrenia symptoms vary widely from one case to another. Neil Thomas (2015) points out that different studies have involved the use of different CBT techniques and people with different combinations of positive and negative symptoms. The overall modest benefits of CBT for schizophrenia probably conceal a wide variety of effects of different CBT techniques on different symptoms.

This makes it hard to say how effective CBT will be for a particular person with schizophrenia.

Evaluation eXtra

Does CBT cure?

CBT may improve the quality of life for people with schizophrenia but not actually 'cure' them. As schizophrenia appears to be largely a biological condition we would expect that a psychological therapy like CBT just benefits people by improving their ability to live with schizophrenia.

On the other hand studies report significant reductions in the severity of both positive and negative symptoms. This suggests that CBT does more than enhance coping.

Consider: *Does CBT potentially cure schizophrenia?*

Evaluation

Evidence of effectiveness

One strength of family therapy for schizophrenia is evidence of its effectiveness.

A review of studies by William McFarlane (2016) concluded that family therapy was one of the most consistently effective treatments available for schizophrenia. In particular relapse rates were found to be reduced, typically by 50–60%. McFarlane also concluded that using family therapy as mental health initially starts to decline is particularly promising. Clinical advice from NICE recommends family therapy for everyone with a diagnosis of schizophrenia.

This means that family therapy is likely to be of benefit to people with both early and 'full-blown' schizophrenia.

Benefits to whole family

A further strength of family therapy for schizophrenia is the benefits for all family members.

Therapy is not just for the benefit of the *identified patient* but also for the families that provide the bulk of care. A review of evidence by Fiona Lobban and Christine Barrowclough (2016) concluded that these effects are important because families provide the bulk of care for people with schizophrenia. By strengthening the functioning of a whole family, family therapy lessens the negative impact of schizophrenia on other family members and strengthens the ability of the family to support the person with schizophrenia.

This means that family therapy has wider benefits beyond the obvious positive impact on the *identified patient*.

Evaluation eXtra

Which matters most?

Because family therapy reduces relapse rates and makes families better able to provide the bulk of care it has huge economic benefits. The State does not need to pay so much.

On the other hand, family therapy also has very significant therapeutic benefits for people with schizophrenia and their families.

Consider: *Is family therapy primarily for economic or therapeutic benefit?*



CBT for schizophrenia may involve teaching people to ignore hallucinations and gently challenge delusions.

Apply it Methods — Meta-analysis

Jauhar *et al.* (see left) carried out a meta-analysis on the results of 34 studies assessing the effectiveness of CBT in the treatment of schizophrenia. They concluded that individuals undergoing CBT were better off for both positive and negative symptoms than controls ($p < 0.001$).

Questions

1. Explain what $p < 0.001$ means. (*2 marks*)
2. Typically we say that a difference between conditions is **significant** when $p < 0.05$. How significant is $p < 0.001$ compared to $p < 0.05$? (*2 marks*)

Apply it Concepts — A case of high EE

Ran has just come out of hospital after an episode of schizophrenia. His symptoms are under control as long as he takes his medication and he has returned to live with his mother and two sisters. Ran's psychiatrist is concerned however by the high levels of expressed emotion in Ran's family. She recommends family therapy for Ran's family.

Questions

1. What might be the benefits of family therapy for Ran and his family?
2. If Ran's family ask his psychiatrist about the effectiveness of family therapy what might she tell them?

Study tip

Both of the therapies discussed are named in the specification which means you need to be able to describe and evaluate each. The questions below are just a sample – you might develop some further possibilities.

Check it

1. Briefly explain how cognitive behaviour therapy is used in the treatment of schizophrenia. *[4 marks]*
2. Outline the use of family therapy to treat schizophrenia. *[4 marks]*
3. Evaluate the use of cognitive behaviour therapy to treat schizophrenia. *[6 marks]*
4. 'Cognitive behaviour therapy and family therapy are both used in the treatment of schizophrenia'. Discuss the use of these methods for the treatment of schizophrenia. *[16 marks]*

Management of schizophrenia

The specification says...

Token economies as used in the management of schizophrenia.

This spread is concerned with the management of schizophrenia. Token economies are sometimes regarded as a way to manage schizophrenia as opposed to treat it because the aim is to make behaviour more socially acceptable rather than to reduce symptoms. To a behaviourist psychologist this amounts to a treatment!

Key term

Token economies A form of behavioural modification, where desirable behaviours are encouraged by the use of selective reinforcement. For example, people are given rewards (tokens) when they engage in socially desirable behaviours. The tokens are secondary reinforcers and can then be exchanged for primary reinforcers – food or privileges.



People with schizophrenia who are hospitalised may develop bad habits, such as wearing pyjamas all day. Token economies may be a way of improving self-care.

Apply it Concepts Ashkan

Ashkan has been living in an Iranian psychiatric hospital for the last six months with a diagnosis of schizophrenia. Prior to developing schizophrenia Ashkan was a physically active sociable young man who liked to lift weights. Iranian psychiatric services use token economies more commonly than those in the UK.

Questions

1. Identify *one* target behaviour that a token economy system designed for Ashkan might focus on.
2. Identify a suitable reward that Ashkan might want to exchange tokens for.

Token economies for schizophrenia

Token economies are reward systems used to manage the behaviour of people with **schizophrenia**, in particular those who have developed patterns of maladaptive behaviour through spending long periods in psychiatric hospitals.

Developing token economies with schizophrenia

The classic demonstration of a **token economy** was carried out by Teodoro Ayllon and Nathan Azrin (1968). They trialled a token economy system in a ward of women with a diagnosis of schizophrenia. Every time the participants carried out a task such as making their bed or cleaning up they were given a plastic token embossed with the words 'one gift'. These tokens could then be swapped for ward privileges, for example being able to watch a film. The number of tasks carried out increased **significantly**.

Token economies were extensively used in the 1960s and 70s when the norm for treating schizophrenia was long-term hospitalisation. Their use has now declined in the UK, partly because of the growth of community-based care and the closure of many psychiatric hospitals, but also because of the complex **ethical issues** raised by restricting rewards to people with mental disorders. However token economies still remain a standard approach to managing schizophrenia in many parts of the world.

Rationale for token economies

Institutionalisation develops under circumstances of prolonged hospitalisation. One outcome is that people often develop bad habits, for example they might cease to maintain good hygiene or perhaps stop socialising with others. This is an understandable response to living without the kind of routine and small pleasures we experience in everyday life.

Johnny Matson *et al.* (2016) identify three categories of institutional behaviour commonly tackled by means of token economies: personal care, condition-related behaviours (e.g. apathy) and social behaviour.

Modifying these behaviours does not cure schizophrenia but it has two major benefits:

1. Improves the person's quality of life within the hospital setting, for example make-up for someone who usually takes a lot of pride in their appearance or social interaction for a usually sociable person.
2. 'Normalises' behaviour and this makes it easier for people who have spent a time in hospital to adapt back into life in the community, for example getting dressed in the morning or making their bed.

What is involved in a token economy?

The idea is that tokens – for example, in the form of coloured discs – are given immediately to individuals when they have carried out a desirable behaviour. Target behaviours are decided on an individual basis and it is important to know the person in order to identify the most appropriate target behaviours for them (Cooper *et al.* 2007).

Although the tokens have no value in themselves they are swapped later for more tangible rewards. Having some form of immediate reward for target behaviour is important because delayed rewards are less effective. Tokens are therefore administered as soon as possible after a target behaviour. Rewards in a hospital setting might include objects like sweets or magazines, or access to activities like a film or a walk outside, or perhaps an appointment with a social worker to plan for life after hospitalisation.

Theoretical understanding of token economies

Token economies are an example of **behaviour modification** – a behavioural therapy based on **operant conditioning**. Tokens are **secondary reinforcers** because they only have value once the person receiving them has learned that they can be used to obtain meaningful rewards, such as sweets or a walk outside. These meaningful rewards are **primary reinforcers**. Those tokens that can be exchanged for a range of different primary reinforcers are particularly powerful secondary reinforcers. Such secondary reinforcers are called *generalised reinforcers*.

In order for the tokens to become secondary reinforcers they are paired with primary reinforcers, so at the start of a token economy programme tokens and primary reinforcers are administered together.

Evaluation

Evidence of effectiveness

One strength of token economies for the management of schizophrenia is evidence for their effectiveness.

Krista Glowacki *et al.* (2016) identified seven high quality studies published between 1999 and 2013 that examined the effectiveness of token economies for people with chronic mental health issues such as schizophrenia and involved patients living in a hospital setting. All the studies showed a reduction in **negative symptoms** and a decline in the frequency of unwanted behaviours.

This supports the value of token economies.

Counterpoint However, seven studies is quite a small evidence base to support the effectiveness of a technique. One issue with a small number of studies is the **file drawer problem**. This phenomenon leads to a bias towards positive published findings because undesirable results have been 'filed away'. This is a particular problem in reviews that only include a small numbers of studies.

This means that there is a serious question over the evidence for the effectiveness of token economies.

Ethical issues

One limitation with the use of token economies to manage schizophrenia is the **ethical issues** raised.

The use of token economies raises ethical issues because it gives professionals considerable power to control the behaviour of people in the role of patient. This inevitably involves imposing one person's (or institution's) norms on to others, which is especially problematic if target behaviours are not identified sensitively. For example, someone who likes to look scruffy and get up late might have these personal freedoms curtailed. Perhaps more seriously, restricting the availability of pleasures (e.g. having sweets or seeing films) to people who don't behave as desired means that seriously ill people, who are already experiencing distressing symptoms, have an even worse time. Legal action by families who see their relative in this position has been a major factor in the decline in the use of token economies.

This means that the benefits of token economies may be outweighed by their impact on personal freedom and short-term reduction in quality of life.

Alternative approaches

A further limitation of token economies is the existence of more pleasant and ethical alternatives.

Even if token economies can be helpful for managing schizophrenia there are other approaches with a comparable evidence base that do not raise the same ethical issues. For example, a review by Mathew Chiang *et al.* (2019) concluded that art therapy might be a good alternative. The evidence base is regularly small and has some methodological limitations, but it appears to show that art therapy is a high-gain low-risk approach to managing schizophrenia. Even if the benefits of art therapy are modest, this is generally true for all approaches to treatment and management of schizophrenia and, unlike alternatives, art therapy is a pleasant experience without major risks of side effects or ethical abuses. NICE guidelines recommend art therapy for schizophrenia.

This means that art therapy might be a good alternative to token economies.

Evaluation eXtra

Benefits

One problem with token economies is that they are very difficult to continue once a person is outside a hospital setting. This is because target behaviours cannot be monitored closely and tokens cannot be administered immediately.

On the other hand, some people with schizophrenia may only get the chance to live outside a hospital if their personal care and social interaction can be improved. And perhaps the best way to achieve this is using a token economy during hospital care.

Consider: *Is it worth using token economies to manage behaviour in schizophrenia?*



Token economies raise ethical issues.

Apply it Concepts — What would you do?

Imagine that your cousin has been in hospital diagnosed with schizophrenia for a while now, and his psychiatrist has suggested using a token economy to improve his social interaction prior to moving him back into the community.

Questions

1. What reasons would you have for optimism and what concerns might you have about this?
2. What might you suggest in order to increase the chances of your cousin's successful reintegration into the community and mitigate issues associated with token economies?
3. Identify *one* alternative approach the psychiatrist could use to improve your cousin's interaction with others.

Apply it Methods — Reviews and meta-analyses

In the last three spreads we have talked about review studies and meta-analyses as well as individual studies of treatment effectiveness.

Questions

1. Explain what is meant by a **review study** and by **meta-analysis**. (*2 marks + 2 marks*)
2. Explain *one* strength of employing review methods as opposed to looking separately at small-scale studies. (*3 marks*)

Check it

1. Explain how a token economy could be used in the management of schizophrenia. *[4 marks]*
2. Explain the difference between treating schizophrenia with family therapy and managing schizophrenia with a token economy. *[4 marks]*
3. Evaluate the use of token economy to manage schizophrenia. *[6 marks]*
4. Discuss token economies as used in the management of schizophrenia. *[16 marks]*

The interactionist approach to schizophrenia

The specification says...

The importance of an interactionist approach in explaining and treating schizophrenia; the diathesis-stress model.

This spread is concerned with the interactionist approach to schizophrenia. This involves taking account of both biological and psychological factors when considering the development of schizophrenia and also when considering the treatment of schizophrenia.

Key terms

Interactionist approach A way to explain the development of behaviour in terms of a range of factors, including both biological and psychological ones. Most importantly such factors don't simply add together but combine in a way that can't be predicted by each one separately i.e. they interact.

Diathesis-stress model An interactionist approach to explaining behaviour. For example schizophrenia is explained as the result of both an underlying vulnerability (diathesis) and a trigger (stressor), both of which are necessary for the onset of schizophrenia. In early versions of the diathesis-stress model, vulnerability was genetic and triggers were psychological. Nowadays both genes and trauma are seen as diatheses, and stress can be psychological or biological in nature.



High doses of THC-rich cannabis can trigger schizophrenia in those with an existing vulnerability, especially when taken in the early teens.

Apply it Concepts Alison

Alison has a family history of schizophrenia and has spent time in foster care following childhood abuse. At the age of 17 she has recently been in a serious accident and is considering smoking cannabis for pain relief and to help her relax.

Question

Referring to the diathesis-stress model of schizophrenia, how could you explain to Alison that she would be unwise to smoke cannabis?

The interactionist approach

Put simply the **interactionist approach** (also sometimes called the 'biosocial approach') is an approach that acknowledges that there are biological, psychological and social factors in the development of **schizophrenia**. Biological factors include genetic vulnerability and neurochemical and neurological abnormality. Psychological factors include stress, for example, resulting from **life events** and **daily hassles**, including social factors such as poor quality interactions in the family.

The diathesis-stress model

The **diathesis-stress model** is one way to present an interactionist approach. *Diathesis* means vulnerability. In this context *stress* simply means a negative experience. The diathesis-stress model says that both a vulnerability to schizophrenia and a stress-trigger are necessary in order to develop the disorder. One or more underlying factors make a person particularly vulnerable to developing schizophrenia but the onset of the condition is triggered by stress.

Meehl's model In the original diathesis-stress model (Meehl 1962) diathesis (vulnerability) was entirely **genetic**, the result of a single 'schizogene'. This led to the idea of a biologically based *schizotypic personality*, one characteristic of which is sensitivity to stress. According to Paul Meehl, if a person does not have the schizogene then no amount of stress would lead to schizophrenia. However, in carriers of the gene, chronic stress through childhood and adolescence, in particular the presence of a **schizophrenogenic mother** (see page 206), could result in the development of the disorder.

Modern understanding of diathesis One way in which our understanding of diathesis has changed is that it is now clear that many genes each appear to increase genetic vulnerability only slightly, there is no single 'schizogene' (Ripke *et al.* 2014). Modern views of diathesis also include a range of factors beyond the genetic, including psychological trauma (Ingram and Luxton 2005) – so trauma becomes the diathesis rather than the stressor. John Read *et al.* (2001) proposed a neurodevelopmental model in which early trauma alters the developing brain. Early and severe enough trauma, such as child abuse, can seriously affect many aspects of brain development. For example the **hypothalamic-pituitary-adrenal** (HPA) system can become overactive, making a person much more vulnerable to later stress.

Modern understanding of stress In the original diathesis-stress model of schizophrenia, stress was seen as psychological in nature, in particular related to parenting. Although psychological stress, including that resulting from parenting may still be considered important, a modern definition of stress (in relation to the diathesis-stress model) includes anything that risks triggering schizophrenia (Houston *et al.* 2008). Much of the recent research into factors triggering an episode of schizophrenia has concerned cannabis use. In terms of the diathesis-stress model cannabis is a stressor because it increases the risk of schizophrenia by up to seven times according to dose. This may be because cannabis interferes with the **dopamine** system. However, most people do not develop schizophrenia after smoking cannabis presumably because they lack the requisite vulnerability factors.

Treatment according to the interactionist model

The interactionist model of schizophrenia acknowledges both biological and psychological factors in schizophrenia and is therefore compatible with both biological and psychological treatments. In particular the model is associated with combining **antipsychotic** medication and psychological therapies, most commonly **CBT**.

Douglas Turkington *et al.* (2006) point out that it is perfectly possible to believe in biological causes of schizophrenia and still practise CBT to relieve psychological symptoms. However, this requires adopting an interactionist model – it is not possible to adopt a purely biological approach and tell people diagnosed with schizophrenia that their condition is purely biological and that there is no psychological significance to symptoms, and then to simultaneously treat them with CBT.

In Britain it is increasingly standard practice to treat people diagnosed with schizophrenia with a combination of antipsychotic drugs and CBT. In the US there is more of a history of conflict between psychological and biological models of schizophrenia and this may have led to slower adoption of an interactionist approach. Thus medication without an accompanying psychological treatment is more common in the US than in the UK.

Evaluation

Support for vulnerability and triggers

One strength of the interactionist approach to schizophrenia is evidence supporting the role of both vulnerability and triggers.

In a large-scale study, Pekka Tienari *et al.* (2004) investigated the impact of both genetic vulnerability and a psychological trigger (dysfunctional parenting). The study followed 19,000 Finnish children whose biological mothers had been diagnosed with schizophrenia. In adulthood this high genetic risk group were compared to a **control group** of adoptees without a family history of schizophrenia (low genetic risk). Adoptive parents had been assessed for child-rearing style and it was found that high levels of criticism, hostility and low levels of empathy were strongly associated with the development of schizophrenia, but only in the high genetic risk group.

This shows that a combination of genetic vulnerability and family stress can lead to greatly increased risk of schizophrenia.

Diathesis and stress are complex

One limitation of the original diathesis-stress model is oversimplicity.

It is now clear that the original model that portrayed diathesis as a single schizogene and portrayed stress as schizophrenogenic parenting is hopelessly simplistic. Multiple genes in multiple combinations influence diathesis. Stress also comes in many forms, including but not limited to dysfunctional parenting. In fact diathesis can also be influenced by psychological factors and stress can be biological as well as psychological. This is shown in a study by James Houston *et al.* (2008), in which childhood sexual abuse emerged as the major influence on underlying vulnerability to schizophrenia and cannabis use as the major trigger.

This means that there are multiple factors, both biological and psychological, affecting both diathesis and stress, supporting the modern understanding of both diathesis and stress.

Real-world application

One further strength of the interactionist approach is in the combination of biological and psychological treatments.

A practical application of acknowledging biological and psychological factors in schizophrenia has been the combination of drug treatment and psychological therapies. Studies show that combining treatments enhances their effectiveness. For example Nicholas Tarrier *et al.* (2004) **randomly allocated** 315 participants to (1) medication + CBT, (2) medication + counselling, or (3) control group (medication only). Participants in the two combination groups showed lower symptoms following the trial than the medication-only group, though there was no difference in hospital readmission.

This means that there is a clear practical advantage to adopting an interactionist approach to schizophrenia in terms of superior treatment outcomes.

Counterpoint Matt Jarvis and Paul Okami (2019) point out that saying that a successful treatment for mental disorder justifies a particular explanation is the logical equivalent of saying that because alcohol reduces shyness, shyness is caused by lack of alcohol. This logical error is called the *treatment-causation fallacy*.

Therefore we cannot automatically assume that the success of combined therapies means interactionist explanations are correct.

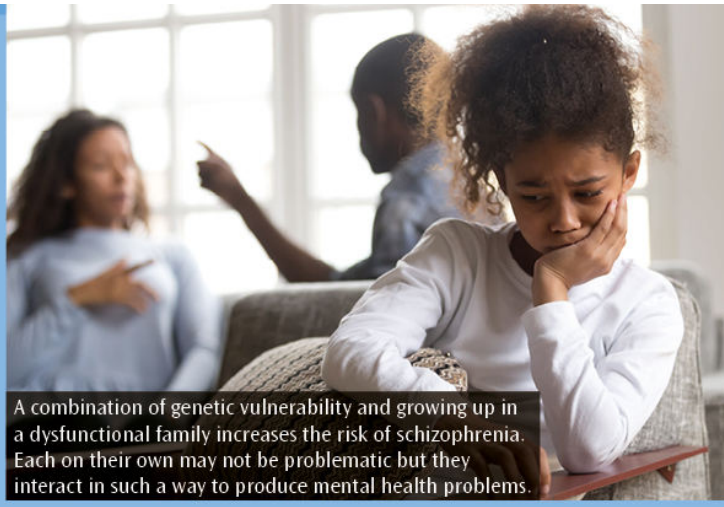
Evaluation eXtra

Urbanisation

Schizophrenia is more commonly diagnosed in urban than rural areas. This statistic is sometimes used to justify the interactionist position, as it assumes that urban living is more stressful than rural and therefore city living acts as a trigger.

However, it may simply be that schizophrenia is more likely to be diagnosed in cities, or that people with a diathesis for schizophrenia (e.g. teenagers abused as children) tend to migrate to cities.

Consider: *Is the greater frequency of schizophrenia diagnosis in cities evidence for a diathesis-stress model of schizophrenia?*



A combination of genetic vulnerability and growing up in a dysfunctional family increases the risk of schizophrenia. Each on their own may not be problematic but they interact in such a way to produce mental health problems.

Apply it Concepts

The interactionist approach

Whitney is in hospital having recently been diagnosed with schizophrenia. Her family are confused at the doctor's explanation that schizophrenia is partly biologically-caused, and his recommendation that she be treated with both antipsychotics and CBT.

Question

Referring to the interactionist approach to schizophrenia, explain why Whitney's psychiatrist takes this view and recommends both medication and a psychological treatment.

Apply it Methods

A survey of diathesis-stress

In the Houston *et al*. study (see left), 5877 participants responded to a survey, 543 reported a childhood sexual trauma and 643 reported using cannabis before the age of 16.

Questions

1. Is the data above **quantitative** or **qualitative data**? Explain your answer. (*2 marks*)
2. Surveys can involve **questionnaires** or **interviews**. Explain *one* advantage of using a questionnaire to gather this data. (*2 marks*)
3. a) What is a **closed question**? (*1 mark*)
   b) Why might closed questions be used here? (*2 marks*)
4. Explain *one* **ethical issue** with this study. (*2 marks*)

Check it

1. Explain the importance of adopting an interactionist approach to explaining **and** treating schizophrenia. *[4 marks]*
2. Outline the diathesis-stress model of schizophrenia. *[6 marks]*
3. Describe **and** evaluate the interactionist approach to both explaining **and** treating schizophrenia. *[16 marks]*

Practical corner

The specification says...

> Knowledge and understanding of ... research methods, practical research skills and maths skills. These should be developed through ... ethical practical research activities.

This means that you should conduct practical investigations wherever possible. Because you cannot carry out research on participants with mental health problems you are limited here to research using a non-clinical population. We suggest a survey to investigate how good the layperson's understanding is of schizophrenia and an experiment to show the distracting effect of hearing voices.

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?



It is likely that a layperson will mistakenly think of schizophrenia as 'split personality'.

Practical idea 1: Survey on knowledge of schizophrenia

Studies of **media** portrayal of serious mental disorders like **schizophrenia** have shown highly stereotyped representations. It appears that people who have not studied psychology or related subjects like medicine do not have a good understanding of schizophrenia. The aim of this study is to explore how well the public understands the nature of schizophrenia.

More specifically we are interested in whether there is a difference between psychology students and non-psychology students in their response to statements concerning schizophrenia.

This is an **experiment** because studying or not studying psychology is the **independent variable**. A **questionnaire** is used to collect data.

The practical bit

This is a study of knowledge of schizophrenia. As such data can only be collected using a **self-report** method, i.e. a questionnaire or an **interview** study. We recommend a questionnaire. You will need to construct a questionnaire and use it to collect data from students.

Designing your questionnaire

There are various ways to assess public understanding of schizophrenia. We recommend you test whether people endorse beliefs about schizophrenia. The simplest way to do this is by asking participants to respond to a set of true-or-false questions. Alternatively you could ask participants to respond to statements using a **Likert scale** (strongly agree to strongly disagree).

We suggest that you base some of your statements on false stereotypes about schizophrenia, for example, that schizophrenia involves a 'split personality' and that only people with schizophrenia will experience hallucinations and delusions. Other statements could concern correct information, such as the incidence of schizophrenia in the population being about 1%. Try to use between five and ten statements.

It is important to record information about participants that will determine what they might know about schizophrenia. For the independent variable you will need a question asking whether the respondent has studied psychology or not, and whether their studies included schizophrenia. You might also wish to record any other ways the respondent might know about schizophrenia, for example, having a family member with the condition.

Ethical issues

Because people may see schizophrenia as a sensitive topic it is critical that participants are fully aware that participation is voluntary, that they know exactly what will take place in the study and that they are aware that they have the **right to withdraw** at any time.

Choosing your sample

You will need to consider a suitable **sampling technique** for this study. As always there is a trade-off between sampling techniques that allow you to get a large number of participants quickly and those that allow you to obtain participants who are more representative of their **population**. You also need to think about what is an appropriate sample size for this study.

Analysing your data

You will need to present your results in the form of tables and graphs. You will want to be able to show your results so that someone will instantly be able to see whether there is indeed a difference in understanding of schizophrenia between those who have studied psychology and those who have not.

You may wish to carry out a **statistical test** on your data (see question 4 below).

Table 1 Median number of correct statements.

Participants	Correct statements
Psychology student (n = 15)	8
Layperson (n = 18)	5

Apply it Methods

The maths bit 1

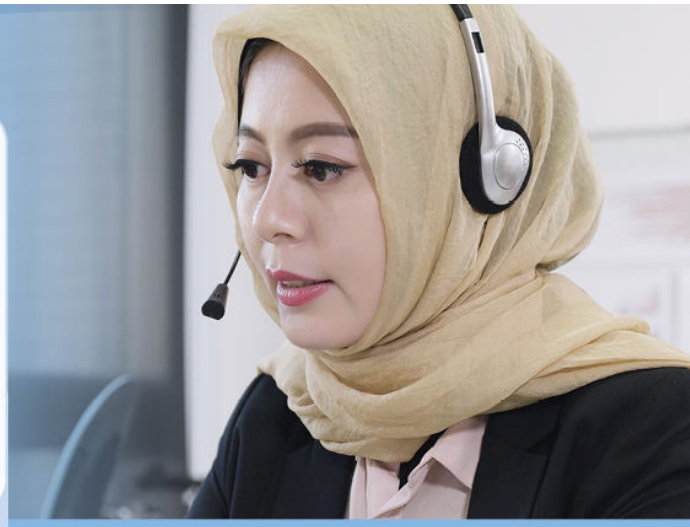
1. In the bottom row of Table 1, n = 18. What does this mean? (*1 mark*)
2. Express the numbers in Table 1 as fractions and percentages. (*4 marks*)
3. What is the **level of measurement** of the data in Table 1? (*1 mark*)
4. What **statistical test** would you carry out to assess the significance of the difference between the two groups? Explain your answer. (*3 marks*)
5. What conclusion would you reach about public understanding of schizophrenia based on the results shown in Table 1? (*2 marks*)

Practical idea 2: The distracting effect of voices

One common symptom of schizophrenia is hearing voices. As well as the distress caused by the things the voices are heard to say, a person who hears voices has to cope with carrying out day-to-day tasks whilst being distracted by voices. It is possible to simulate the experience of having to perform everyday tasks whilst listening to voices by means of playing participants a recording as they complete cognitive tasks.

The **aim** of this study is to test the effect of voices on performance of an everyday cognitive task.

This is a **laboratory experiment**, with the independent variable being the presence or absence of simulated voices and the **dependent variable** being performance on a cognitive task.



You should find that voice distraction has a negative effect on cognitive performance.

The practical bit

Designing your experiment

You will need a design that allows you to compare performance on a task under two **conditions**. In the **experimental condition** participants will listen to voices while they carry out the task, whereas in a **control condition** they will carry out an identical task without the voices. To make sure that all participants have as similar experience as possible they should listen to the same recorded voices at the same volume and use headphones so as to minimise the effect of other sounds in the room. You will need to make a decision about whether to use a **repeated measures** design or an **independent groups** design. A repeated measures design might be better in terms of eliminating the effects of **participant variables** but if you opt for this make sure you can control for order effects by **counterbalancing**.

The voices

You can obtain recordings designed to simulate the voices heard in schizophrenia on YouTube, but for **ethical** reasons you might be better off recording your own voices or something like the news headlines and making sure the content is unlikely to cause distress. The recording will need to be long enough for the task. Check how long it takes to perform your task when you have chosen it.

The cognitive task

In a professional piece of research you would probably give participants more than one task but one should be okay for an A level practical. You can design your own task but in order to ensure all participants have as similar an experience as possible you might be better off using an online procedure. A suitable example is the Stroop task (see page 207), in which you are required to name font-colours of colour words (see above right for weblinks). Other suitable tests include reaction time tests and **short-term memory** tests such as memorising number or letter sequences.

Ethical issues

This experiment should be acceptable as long as you remember you are simply testing the effect of voice-distraction on cognitive performance. Although this is relevant to understanding the experience of schizophrenia, remember that you are not meant to be experimenting on schizophrenia itself. Make sure that your teacher checks that it is appropriate for each individual to take part.

Analysing your data

You will need to present your results in the form of tables and graphs. You will want to be able to show your results so that someone will instantly be able to see whether there is indeed a difference between cognitive performance with and without voice-distraction.

You may wish to carry out a statistical test on your data (see question 4 on right).

Examples of online cognitive tasks

Stroop task

www.onlinestrooptest.com/stroop_effect_test.php

Digit span (short-term memory)

http://cognitivefun.net/test/7

Reaction time

http://getyourwebsitehere.com/jswb/rttest01.html

Apply it

Methods

The maths bit 2

1. Using the data in Table 2 below, calculate the **mean** and **median** number of items remembered with and without voice-distraction. (*4 marks*)
2. Calculate the **range** for each condition. (*2 marks*)
3. What would you conclude from these figures about the effect of voice-distraction on cognitive performance? (*2 marks*)
4. What **statistical test** would you use to analyse the significance of the difference between the scores in the two conditions? Explain your answer. (*3 marks*)
5. This data is **quantitative**. Explain *one* strength of quantitative data. (*2 marks*)

Table 2 Number of items remembered in a short-term memory test.

Participant number	With voices	Without voices
1	6	8
2	4	7
3	7	8
4	6	9
5	6	7
6	4	7
7	5	5
8	6	8
9	5	6
10	4	7

The maths bit

Overall, at least 10% of the marks in assessments for Psychology will require the use of mathematical skills and this is included in the requirement that at least 25–30% in total will involve research methods.

Don't avoid it!

Revision summaries

Introduction to schizophrenia

The nature of schizophrenia.

Diagnosis and classification of schizophrenia

Diagnosis and classification

More common in men, city-dwellers and lower socio-economic groups.

Medical approach, classification – identify symptoms that go together = a disorder. Diagnosis – identify symptoms and use classification system to identify the disorder.

Classification either DSM-5 (one positive symptom), ICD-10 (two negative symptoms).

Positive symptoms

Additional symptoms beyond normal experience, including:

- Hallucinations – unusual sensory experiences may be distortion of reality.
- Delusions – beliefs not based in reality, bizarre behaviour.

Negative symptoms

Loss of usual abilities, including:

- Speech poverty – reduced amount and poor quality of speech (DSM includes disorganised).
- Avolition – loss of motivation, low activity.

Evaluation

Good reliability

DSM-5 reliability has improved – inter-rater reliability = +.97 and test-retest reliability = +.92 (Osório *et al.*).

Low validity

100 clients assessed, 68 diagnosed with schizophrenia using ICD-10 and 39 with DSM-IV, low criterion validity (Cheniaux *et al.*).

Counterpoint – alternative diagnostic procedures within DSM-5 show good agreement (Osório *et al.*).

Co-morbidity

Around half of clients also have another diagnosis, e.g. depression, substance abuse (Buckley *et al.*).

Gender bias in diagnosis

Since the 1980s more men than women have received a diagnosis of schizophrenia, suggests there is bias in diagnosis, with women being underdiagnosed due to better interpersonal functioning.

Culture bias in diagnosis

African-Caribbean British 9 times more likely to be diagnosed than white British, maybe because norms in African-Caribbean communities misinterpreted by white clinicians.

Symptom overlap

Symptoms of schizophrenia and e.g. bipolar disorder overlap, both conditions involve delusions and avolition. Makes diagnosis and classification difficult.

Biological explanations for schizophrenia

Genetic, neurochemical and neurological explanations.

Genetic basis

Family studies

Risk of schizophrenia increases with genetic similarity to someone with the condition, e.g. 2% for aunt, 9% for sibling (Gottesman).

Candidate genes

Polygenic (several risk factors) and aetiologically heterogeneous (can result from different combinations of risk factors). 108 genetic variations each slightly increase the risk of schizophrenia (Ripke *et al.*).

The role of mutation

Genetic vulnerability in people with no family history e.g. 2% risk in fathers over 50 (Brown *et al.*).

Evaluation

Research support

Family studies (e.g. Gottesman), adoption studies show heightened risk from biological parents (Tienari *et al.*), twin studies MZ 33% and DZ 7% concordance (Hilker *et al.*).

Environmental factors

Biological factors e.g. birth complications (Morgan *et al.*) and cannabis use (Di Forti *et al.*).

Psychological e.g. childhood trauma (67% versus 38% controls had schizophrenia, Mørkved *et al.*).

Evaluation extra: Genetic counselling

Can advise parents of genetic risks, but risk estimate is an average figure and environmental risk unknown.

Neural correlates

Dopamine (DA)

DA levels in different brain regions correlate with schizophrenia symptoms.

The original DA hypothesis

Antipsychotic drugs produce symptoms similar to Parkinson's (low DA) (Seeman).

Schizophrenia caused by high DA levels in subcortex (*hyper*dopaminergia).

Explains some symptoms e.g. poverty of speech (connection to Broca's disrupted).

Updated versions of the DA hypothesis

High DA in subcortex plus low DA in cortex (*hypo*dopaminergia), explains negative symptoms.

Cortical hypoDA may lead to subcortical hyperDA.

DA levels are affected by both genetic vulnerability and childhood and adolescent stress (Howes *et al.*).

Evaluation

Evidence for dopamine

1. Amphetamines (increase DA) mimic symptoms (Curran *et al.*).
2. Antipsychotic drugs (reduce DA) reduce intensity of symptoms (Tauscher *et al.*).
3. Some candidate genes affect DA.

Glutamate

Post-mortem and scanning studies show high levels in people with schizophrenia (McCutcheon *et al.*), also some candidate genes associated with glutamate.

Evaluation extra: Amphetamine psychosis

Amphetamines (raise DA) produce schizophrenia-like symptoms in rats (Tenn *et al.*), but apomorphine also increases DA but no symptoms (Dépatie and Lal), and amphetamine psychosis not same as schizophrenia (Garson).

Psychological explanations for schizophrenia

Family processes create schizophrenia.

Family dysfunction

The schizophrenogenic mother

Psychodynamic explanation. Cold, rejecting and controlling mother, leads to distrust and paranoid delusions (Fromm-Reichmann).

Double-bind theory

Contradictory family communication, child can't win. Not a cause just a risk factor (Bateson *et al.*).

Expressed emotion (EE)

Families with high levels of hostile EE create a stressful environment that may cause schizophrenia in vulnerable person or at least its relapse.

Evaluation

Research support

Many have insecure attachment (Type C or D) and more than 50% have history of abuse (Read *et al.*).

Explanations lack support

Little evidence for schizophrenogenic mother or double binds except clinical observation and informal assessments.

Evaluation extra: Parent-blaming

Research is useful in showing importance of attachment and trauma, but this line of research has led to parent-blaming.

Ways of thinking with undesirable consequences.

Cognitive explanations

Dysfunctional thinking

Lower levels of functioning in some brain areas, e.g. reduced in ventral striatum, linked to negative symptoms.

Metarepresentation dysfunction

Can't recognise thoughts as one's own, leads to hallucinations and delusions (thought insertion).

Central control dysfunction

Can't suppress automatic responses (triggers other thoughts), leads to speech poverty and derailment of thought.

Evaluation

Research support

People with schizophrenia took much longer to complete the Stroop task, showing impaired cognition (Stirling *et al.*).

A proximal explanation

Explains symptoms of schizophrenia now but not their origins, whereas genes/family dysfunction are distal explanations.

Evaluation extra: Psychological or biological?

Cognitive approach explains psychological symptoms of schizophrenia, but these symptoms probably have a biological origin e.g. genes/abnormal brain (Toulopoulou *et al.*).

Biological therapy for schizophrenia

Most common treatment for schizophrenia.

Drug therapy

Typical antipsychotics

Associated with dopamine hypothesis, first in 1950s but declined in use.

Dopamine antagonists

e.g. *Chlorpromazine*, block dopamine receptors, normalising transmission.

Sedation effect

Chlorpromazine affects histamine receptors, has calming effect.

Atypical antipsychotics

Since 1970s, aim to reduce symptoms without the side effects of typical antipsychotics.

Clozapine

Acts on glutamate and serotonin receptors as well as dopamine receptors. It enhances mood (good for suicide prevention). Risk of fatal agranulocytosis.

Risperidone

Binds more strongly to serotonin receptors so can be used in much smaller doses, leading to fewer side effects.

Evaluation

Evidence for effectiveness

Chlorpromazine more effective than placebo, with reduced symptom severity, over 1000 participants (Thornley *et al.*).

Clozapine more effective than typical antipsychotics, especially treatment-resistant cases (Meltzer).

Counterpoint – short-term studies, some data sets with positive findings published more than once, sedative effects may explain positive results (Healy).

Serious side effects

Mild (e.g. sleepiness, stiff jaw), serious (tardive dyskinesia) and occasionally fatal (neuroleptic malignant syndrome affects hypothalamus).

Mechanism unclear

Most antipsychotics based on dopamine hypothesis which may be wrong. Theoretically they should not work.

Evaluation extra: The chemical cosh

Antipsychotics may be used for benefit of hospital staff to calm patients, but calming may help patients too (e.g. helps CBT).

Psychological therapy for schizophrenia

Used alongside antipsychotic drugs.

Cognitive behaviour therapy

5–20 sessions of CBT, individually or in groups. Deals with thoughts (e.g. delusions) and behaviour.

How cognitive behaviour therapy helps

Therapist helps client make sense of symptoms e.g. understand the origins of voices.

Normalisation used to reduce anxiety and reality testing to challenge delusions.

A case example

Client believed Mafia trying to kill him, other possibilities explored (Turkington *et al.*).

Evaluation

Evidence of effectiveness

34 studies reviewed showed positive and negative symptoms improved (Jauhar *et al.*), auditory hallucinations improved (Pontillo *et al.*), NICE recommends CBT for schizophrenia.

Quality of evidence

Different studies focus on different CBT techniques so not clear which ones may help particular clients (Thomas).

Evaluation extra: Does CBT cure?

CBT not a cure as schizophrenia is biological, just improves quality of life. However CBT has been shown to reduce symptoms.

Family therapy

Related to psychological theories e.g. double-bind and schizophrenogenic mother.

How family therapy helps

Reduces negative emotions – reduce expressed emotion, anger and guilt. Helps prevent relapse.

Improves family's ability to help – therapeutic alliance, understanding of schizophrenia, care for each other.

A model of practice

(1) share information, (2) identify resources, (3) learn mutual understanding, (4) identify unhelpful patterns of interaction, (5) skills training, (6) relapse prevention, (7) maintenance (Burbach).

Evaluation

Evidence of effectiveness

Relapse rates down 50–60%, more effective at beginning of symptoms (McFarlane). NICE recommends.

Benefits to whole family

Reduces negative impact on family and strengthens ability of family to support the identified patient (Lobban and Barrowclough).

Evaluation extra: Which matters most?

Family therapy may be preferred for its economic benefits as it reduces relapse rates, but alternatively the value is the benefits for the client and their family.

Management of schizophrenia

Aims to reduce symptoms and enable recovery.

Token economies

Developing token economies with schizophrenia

Ayllon and Azrin gave plastic gift tokens for making beds and tidying.

In UK common practice in 1960s and 70s, still used elsewhere.

Rationale for token economies (TEs)

Institutionalised behaviours that can be tackled with TE, personal care, condition-related and social behaviour (Matson *et al.*).

Improve quality of life in hospital and 'normalises' behaviour to prepare for life outside hospital.

What is involved in a token economy?

Tokens are given for desirable behaviour (most effective when immediate). Later swapped for rewards e.g. sweets, films.

Theoretical understanding of token economies

An example of behaviour modification, operant conditioning. Tokens are secondary reinforcers, exchanged for primary reinforcers.

Strengthen effect by pairing them together at start, and pairing with multiple primary reinforcers (generalised reinforcers).

Evaluation

Evidence of effectiveness

Seven high quality studies in hospital setting showed a reduction in negative symptoms and unwanted behaviours (Glowacki *et al.*).

Counterpoint – a small evidence base (only seven studies), one issue is the file drawer problem (only positive findings published).

Ethical issues

Professionals have power to control behaviour, imposing their norms on to others. Also restrict pleasures in seriously ill people.

Alternative approaches

Other approaches have a comparable evidence base e.g. art therapy is a pleasant experience without side effects or ethical abuses (Chiang *et al.*).

Evaluation extra: Benefits

Token economies very difficult to continue outside a hospital setting, but some may only leave hospital if behaviours can be improved.

The interactionist approach to schizophrenia

Biological, psychological and social factors.

The approach

Vulnerability (diathesis) and trigger (stress) interact, separately may not lead to schizophrenia.

The diathesis-stress model

Meehl's model – schizogene creates vulnerability to effects of stress (especially a schizophrenogenic mother).

Modern understanding of diathesis – not a single gene, may not even be genetic (e.g. psychological trauma such as child abuse affects HPA).

Modern understanding of stress – any potential trigger – psychological (e.g. parenting) or biological (e.g. cannabis use increases risk x 7).

Treatment according to the interactionist model

Combine antipsychotic drugs and CBT.

Can believe in a biological cause of schizophrenia but use CBT, but then using an interactionist model (Turkington *et al.*).

Combining CBT and drugs more common in UK than US.

Evaluation

Support for vulnerability and triggers

Schizophrenia more likely in children with genetic vulnerability *and* adoptive parents with child-rearing style high in criticism/low in empathy (19,000 Finnish children, Tienari *et al.*).

Diathesis and stress are complex

Original model hopelessly simplistic, many different possibilities e.g. childhood sexual abuse (diathesis) and cannabis use (stressor) (Houston *et al.*).

Real-world application

Greater effectiveness for medication plus psychological therapy (CBT or counselling) than medication alone (Tarrier *et al.*).

Counterpoint – a successful treatment doesn't logically mean the explanation was correct (treatment-causation fallacy, Jarvis and Okami).

Evaluation extra: Urbanisation

Schizophrenia diagnosed more commonly in cities because urban stress is a trigger, but may be due to more frequent diagnosis or social drift to cities.

Practice questions, answers and feedback

Question 1 Outline **one** therapy used to treat schizophrenia. (*2 marks*)	
Morticia's answer *One treatment is family therapy where a therapist works with the client and their family to improve communication (double bind) within the family and reduce expressed emotion.*	A clear, concise answer from Morticia.
Luke's answer *Both typical and atypical antipsychotic drugs are used in the treatment of schizophrenia. Typical antipsychotics are dopamine antagonists that block dopamine receptors, normalising transmission.* *Atypical antipsychotics such as clozapine act on glutamate and serotonin receptors as well as dopamine receptors. This enhances mood as well as reducing symptoms.*	A sophisticated response from Luke which makes good use of relevant terminology. It can be read as one treatment (drugs) but he probably should have made this clearer at the start otherwise the second paragraph might be disregarded.
Vladimir's answer *Drugs are often used to treat schizophrenia, called antipsychotics that reduce levels of dopamine.* *There are also psychological therapies such as family therapies or CBT. These work well in combination with drug therapies.*	Vladimir has misread the question and offers numerous therapies (although the material on drug therapy is the strongest). His answer would be better if he expanded the first point.

Question 2 Explain how a token economy might be used in the management of schizophrenia. (*4 marks*)	
Morticia's answer *A token economy is a method used to manage the mental disorder of schizophrenia. It is based on behaviourist principles because it involves the effects of reinforcement in having primary and secondary reinforcers. The tokens are secondary reinforcers because they have no value in themselves but they become rewarding when they are associated with primary reinforcers such as being able to buy sweets with the tokens or being allowed to watch a film if they have got enough tokens. This is quite an effective way to encourage patients to learn to behave in a more socially acceptable manner.*	Morticia has presumably missed the key word 'how' in the question – because she has focused more on what a token economy is. Though, in doing so, she does include some information that is relevant to how in terms of primary and secondary reinforcers and what the tokens can be exchanged for.
Luke's answer *There are different ways to either treat or manage schizophrenia. One way is token economy. To use this what happens is a therapist first of all thinks of some behaviours, such as making your bed, and then thinks of some rewards, such as having extra sweets. Then patients are told that they can get the rewards if they do the tasks. This means that the patients start doing the behaviours because they will get the rewards.*	In contrast Luke is clearly keyed into 'how' but lets himself down because the answer should be more detailed. He has included some detail by using examples but has left out some of the specialist terms.
Vladimir's answer *A token economy is a system that uses tokens which are usually coloured discs like coins. However the discs can't be used to buy anything. They aren't worth anything except in an institution where you can buy things. This is a good way to encourage patients to start looking after themselves and then they might be in a better shape for going to live in the community. It has been shown to be effective though there are ethical problems.*	Vladimir, like Morticia, has failed to focus on the demands of the question as half of his answer is concerned with somewhat superficial evaluation points.

Question 3 Briefly discuss reliability **and/or** validity in the diagnosis of schizophrenia. (*4 marks*)	
Morticia's answer *Reliability means consistency so we are looking at whether two diagnosticians produce the same diagnosis for the same individual/symptoms.* *In one study, 100 patients were diagnosed by two people and inter-rater reliability was very poor. They used both DSM and ICD (the two main classification systems). There was low agreement on both of them.* *Validity concerns whether we are measuring what was intended and one of the issues is co-morbidity, that is the symptoms may not always lead to a diagnosis of schizophrenia, they may also lead to a diagnosis of another disorder.*	The definition of reliability is well expressed as it is explicitly linked to diagnosis of schizophrenia. The study is plausible but additional detail is needed otherwise we don't know if it is invented. The issue of co-morbidity is relevant to the validity of diagnosis. Evidence to illustrate this could have been provided.
Luke's answer *Osório et al. found that inter-rater reliability for schizophrenia was good using DSM. Same was true for test-retest.* *Different diagnostic systems do not agree on who has schizophrenia, therefore criterion validity is poor.*	Two brief points from Luke, but there is actually quite a bit of detail.
Vladimir's answer *Reliability and validity are both key concepts in making diagnosis meaningful. A diagnosis should be the same every time (reliable) and it also must be valid. You can't say someone has schizophrenia when they don't so we need valid ways of assessing the disorder in the same way that physical illnesses are assessed.*	A fairly unfocused 'ramble' from Vladimir here. The brief reference to reliability is the most convincing part but is not quite detailed enough.

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

Question 4 **Joel and Joey are identical twins in their mid-20s. The twins' mother had schizophrenia. Joel has a good job, is married and has never shown any symptoms of schizophrenia. Joey, however, has recently been diagnosed with schizophrenia. Last month he was made redundant and has been having relationship problems with his girlfriend.**

Discuss the importance of an interactionist approach in explaining and/or treating schizophrenia. Refer to Joel and Joey in your answer. (*16 marks*)

Morticia's answer *The interactionist approach suggests that we should draw on both biological and psychological explanations when trying to account for the development of schizophrenia. Such an approach can explain the twins Joel and Joey because it would combine the genetic influence – both twins would inherit the same genes from their mother, as they are identical. So we presume they both inherited a gene for schizophrenia. However, this gene has only been expressed in one of the twins, which can be explained in terms of life experiences. The diathesis-stress model expresses this relationship. A diathesis is the biological/genetic factor and 'stress' is the trigger caused by life experiences. In Joey that would appear to be his redundancy at work and relationship problems, which have acted as a trigger to an existing biological vulnerability.*	**Morticia's outline of the diathesis-stress model is clear and accurate, and the application to the stem is very well explained.**
There is plenty of evidence that genetics do play a role in the development of schizophrenia. Family and twin studies showing an increasing concordance the closer two people are genetically – so concordance is highest for identical twins and lower in non-identical twins, siblings, cousins and so on.	**In paragraph 2 a specific study might have been better here, though the point made is relevant.**
However, concordance is never 100%, which means that genes can't be the whole story. There must be other factors involved. There is also evidence that supports psychological explanations, such as a large number of people with schizophrenia report childhood sexual abuse or insecure attachment that would act as stressors. In the case of Joey the stressors are literally stressful experiences in life. The diathesis-stress model makes sense in terms of our understanding of epigenetics and nature versus nurture in general because we now know that neither nature nor nurture exist alone. Epigenetics is the understanding that genes are switched on and off during development by things such as stressful experiences.	**In this paragraph there is another good link to the stem and sophisticated material linking the model to the emerging field of epigenetics (using information from the nature–nurture debate, on page 100).**
This interactionist understanding has important implications for therapy as it suggests that combined therapies may be best. A genetic cause would lead to abnormal levels of neurotransmitters and therefore drug therapy may be useful to treat this aspect of the disorder. At the same time psychological therapies such as CBT may help to deal with issues such as child abuse or depression from redundancy/relationship breakdown. There is research support for this kind of interactionist view. However, just because such approaches are successful doesn't mean the interactionist model does explain schizophrenia.	**Paragraph 4 contains relevant material and the question does allow for discussion of therapy as well as theory.** **The final paragraph doesn't contain much of merit.**
The twins may also think about their own children and the fact that they may also have vulnerabilities for the disorder. However, understanding how genes works means they shouldn't worry too much because they are only one of many influences. **(418 words)**	**One issue with this essay is the rather vague references to evidence which means that quite a lot of it is rather generic instead of being specific to schizophrenia. This detracts from the overall quality of the answer.**
Vladimir's answer *The diathesis-stress model is an interactionist approach. According to this model, both twins would have inherited genes that cause schizophrenia. These create a vulnerability to develop the disorder (a diathesis) which is only expressed if something triggers the conditions such as the stressful life events that Joey has recently experienced.*	**A much more concise opening from Vladimir but the description and application is still effective.**
In fact, a more modern understanding of diathesis is that there isn't just one 'schizogene' (Ripke et al.). In fact it isn't just genes but anything can act as a vulnerability, for example, abuse in early childhood. So it might be that the twins have other diatheses which have made them vulnerable. It might not be genetic at all. Along with a more modern understanding of diathesis is a more modern understanding of 'stress', which is really anything that triggers schizophrenia. In fact, one of the currently 'popular' stressors is cannabis use (Houston et al. 2008). It is thought that cannabis interferes with dopamine. Therefore this is a stressor which is in fact biological.	**Good use of evidence here (something the previous answer lacked) to support an impressive discussion on the nature of 'diathesis' and 'stress'.**
Research supports the importance of genetic factors in schizophrenia. For example, a study by Gottesman et al. showed that risk of developing schizophrenia increased as genetic similarity increased: 2% of first cousins developed schizophrenia compared with 17% of non-identical twins and 48% of identical twins. Clearly this evidence also shows there is a large component not accounted for by the genes. In a very large-scale study Tienari et al. illustrated the interactionist model. They followed 19,000 adopted children in Finland whose mothers had schizophrenia. The child-rearing styles of the adopted parents were observed. Those children who were brought up in families with a lot of criticism and low empathy were much more likely to develop schizophrenia when compared to a control group of adopted children who did not have any genetic vulnerability.	**In paragraph 3 there is specific detail of relevant evidence and it's used effectively to support the argument. The classic study by Tienari *et al*. is explained clearly and made relevant to the debate.**
Using an interactionist model has implications for therapies that address biological elements such as dopamine levels as well as providing psychological support such as CBT. Tarrier et al. found that patients given combined therapies of medication + CBT/counselling had lower symptom levels than a control group with just one treatment (medication only). However, the success of such approaches does not mean that the explanation is correct. This is called the treatment-causation fallacy. **(368 words)**	**The contrast between this and the previous essay is clear in the final paragraph. Here there is excellent use of evidence to illustrate points and support discussion. However, the essay lacks application (which is why it is relatively short for a 16-mark answer). This reduces the overall value of the response despite a wealth of knowledge.**

Multiple-choice questions

Introduction to schizophrenia

1. What percentage of the population are diagnosed with schizophrenia?
   (a) 1%.
   (b) 2%.
   (c) 5%.
   (d) 10%.

2. Which of the following is a positive symptom of schizophrenia?
   (a) Avolition.
   (b) Hallucinations.
   (c) Speech poverty.
   (d) Emotional flatness.

3. How many people with schizophrenia also experience substance abuse?
   (a) 5%.
   (b) 29%.
   (c) 47%.
   (d) 81%.

4. The occurrence of two or more disorders together is called:
   (a) Delusions.
   (b) Co-morbidity.
   (c) Symptom overlap.
   (d) High reliability.

5. Which of the following is true of the diagnosis of schizophrenia?
   (a) Women have always been more likely to be diagnosed than men.
   (b) White British are more likely than African-Caribbean British to receive a diagnosis.
   (c) Since the 1980s women are more likely to receive a diagnosis.
   (d) Since the 1980s men are more likely to be diagnosed than women.

6. Which of the following is a negative symptom of schizophrenia?
   (a) Hallucinations.
   (b) Avolition.
   (c) Delusions.
   (d) Speech disorganisation.

Biological explanations for schizophrenia

1. Approximately how many candidate genes are believed to be associated with schizophrenia?
   (a) 1.
   (b) 25.
   (c) 100.
   (d) 2000.

2. What is the risk of developing schizophrenia for someone who has a sibling with the condition?
   (a) 1%.
   (b) 9%.
   (c) 25%.
   (d) 50%.

3. Which is an example of a neural correlate of schizophrenia?
   (a) Serotonin.
   (b) Adrenaline.
   (c) Dopamine.
   (d) All the above.

4. The prefix 'hyper' means:
   (a) Low.
   (b) Around.
   (c) Fixed.
   (d) High.

5. Which of the following is a true statement about dopamine and schizophrenia?
   (a) Schizophrenia is associated with low levels of dopamine in the subcortex.
   (b) A high number of dopamine receptors in Broca's area may be associated with auditory hallucinations.
   (c) Schizophrenia is associated with high levels of dopamine in the cortex.
   (d) Dopamine appears to be the only neurotransmitter associated with schizophrenia.

6. Which of the following is *not* true of dopamine?
   (a) It is associated with the sensation of pleasure.
   (b) High levels are associated with Parkinson's.
   (c) High levels are associated with schizophrenia.
   (d) High levels are associated with excitation.



Psychological explanations for schizophrenia

1. Parenting characterised by mixed messages is the main feature of which explanation?
   (a) The double-bind theory.
   (b) The schizophrenogenic mother.
   (c) Expressed emotion.
   (d) Dysfunctional thought processing.

2. According to Fromm-Reichmann, who is mostly involved in causing schizophrenia?
   (a) The father.
   (b) Siblings.
   (c) The whole family.
   (d) The mother.

3. What kind of dysfunctional thought processing might lead to hallucinations?
   (a) Central control problems.
   (b) Double binds.
   (c) Metarepresentation difficulty.
   (d) Thought insertion.

4. The Stroop task was used by Stirling *et al.* to demonstrate:
   (a) Family dysfunction.
   (b) Expressed emotions.
   (c) Metarepresentation.
   (d) Dysfunctional thought processing.

5. Which of the following is a component of high expressed emotion?
   (a) Verbal criticism of the family member, occasionally with violence.
   (b) Parenting characterised by double binds.
   (c) Cold, harsh and rejecting mothering.
   (d) Dysfunctional thought processing.

6. Which of the following best describes a limitation of cognitive explanations for schizophrenia?
   (a) There is no evidence for dysfunctional information processing in schizophrenia.
   (b) Evidence for dysfunctional information processing in schizophrenia is mixed.
   (c) Evidence for dysfunctional information processing in schizophrenia only explains its proximal causes.
   (d) Evidence for dysfunctional information processing in schizophrenia only explains its distal causes.

Biological therapy for schizophrenia

1. What explanation for schizophrenia are antipsychotics most strongly linked to?
   (a) The subcortical hyperdopaminergic theory.
   (b) The cortical hypodopaminergic theory.
   (c) Neural correlates.
   (d) The genetic basis of schizophrenia.

2. Which of the following distinguishes atypical psychotics from typical?
   (a) They are more complicated to take.
   (b) They have fewer side effects.
   (c) They are taken in higher doses.
   (d) They act on just the dopamine system.

3. Clozapine works on dopamine and:
   (a) Cortisol.
   (b) Adrenaline.
   (c) Glumamate.
   (d) Acetylcholine.

4. A symptom of neuroleptic malignant syndrome is:
   (a) Weight gain.
   (b) Facial twitching.
   (c) Dizziness.
   (d) Delirium.

5. **Which of the following best describes the effectiveness of antipsychotics?**
   (a) There is no evidence for their effectiveness.
   (b) Antipsychotics are associated with symptom reduction.
   (c) Antipsychotics are associated with improved overall functioning.
   (d) Antipsychotics are associated with improved function and symptom reduction.

6. **What is the problem with evidence for the effectiveness of antipsychotics?**
   (a) Some data has been published several times.
   (b) Antipsychotics may make people simply appear better because they have a calming effect.
   (c) Most trials look at short term effects not long term effects.
   (d) All of the above.

Psychological therapy for schizophrenia

1. **CBT for schizophrenia involves which of the following?**
   (a) Reviewing the individual's early family life.
   (b) Using tokens to reward appropriate behaviour.
   (c) Challenging delusional beliefs.
   (d) Reducing expressed anger in family members.

2. **Which of the following is an aim of family therapy?**
   (a) Reducing levels of expressed emotion.
   (b) Encouraging family to form a therapeutic alliance.
   (c) Learning stress management techniques.
   (d) All the above.

3. **In CBT individuals are encouraged to think of hearing voices as an extension of ordinary experience. This is called:**
   (a) Rationalisation.
   (b) Reality testing.
   (c) Normalisation.
   (d) Ordinarification.

Just a quick reminder – schizophrenia is not split personality.



4. **Which of the following is a limitation of research on psychological treatments for schizophrenia?**
   (a) Different studies look at different CBT techniques.
   (b) There is no evidence for the effectiveness of psychological treatments.
   (c) Psychological treatments are generally considered unethical.
   (d) Treatments do not improve quality of life for individuals.

5. **In family therapy the member with the diagnosis is called the:**
   (a) Identified problem.
   (b) Identified patient.
   (c) Identified person with schizophrenia.
   (d) Identified target.

6. **McFarlane concluded that family therapy reduces relapse rates by as much as:**
   (a) 30–40%.
   (b) 40–50%.
   (c) 50–60%
   (d) 60–70%.

Management of schizophrenia

1. **Why has the use of token economies declined in the UK?**
   (a) A shift to community-based care.
   (b) Concern about ethical issues.
   (c) Both (a) and (b).
   (d) Neither (a) nor (b) – something else.

2. **Which of the following is a feature of institutionalisation?**
   (a) Excessive pride in appearance.
   (b) Obsessive cleaning.
   (c) Increase in frequency of positive symptoms.
   (d) Not getting dressed.

3. **Which of the following is true of token economies?**
   (a) Tokens are given a few hours after good behaviours.
   (b) Tokens are valuable in themselves.
   (c) Rewards include privileges and activities.
   (d) Tokens are primary reinforcers.

4. **Which term best describes tokens?**
   (a) Secondary reinforcers.
   (b) Primary reinforcers.
   (c) Uncontrollable reinforcers.
   (d) Delayed reinforcers.

5. **Which of the following is an ethical issue associated with token economies?**
   (a) Token economies have serious side effects.
   (b) Token economies are based on what someone believes is 'normal'.
   (c) Token economies can make symptoms worse.
   (d) There is no evidence for the effectiveness of token economies.

6. **Which of these is a problem for token economies?**
   (a) Small evidence base.
   (b) Other equally effective approaches.
   (c) Serious ethical issues.
   (d) All of these.

The interactionist approach to schizophrenia

1. **The interactionist approach is also known as the:**
   (a) Psychological model.
   (b) Biosocial model.
   (c) Biological model.
   (d) Social-psychological model.

2. **The term 'diathesis' means:**
   (a) Biological.
   (b) Genetic.
   (c) Vulnerability.
   (d) Early trauma.

3. **Meehl's model of schizophrenia includes which of the following elements?**
   (a) A schizogene.
   (b) A schizophrenogenic mother.
   (c) A schizotypic personality.
   (d) All the above.

4. **Treatment according to the interactionist model is most likely to combine:**
   (a) Typical and atypical antipsychotics.
   (b) Antipsychotics and CBT.
   (c) CBT and family therapy.
   (d) Antipsychotics and nursing support.

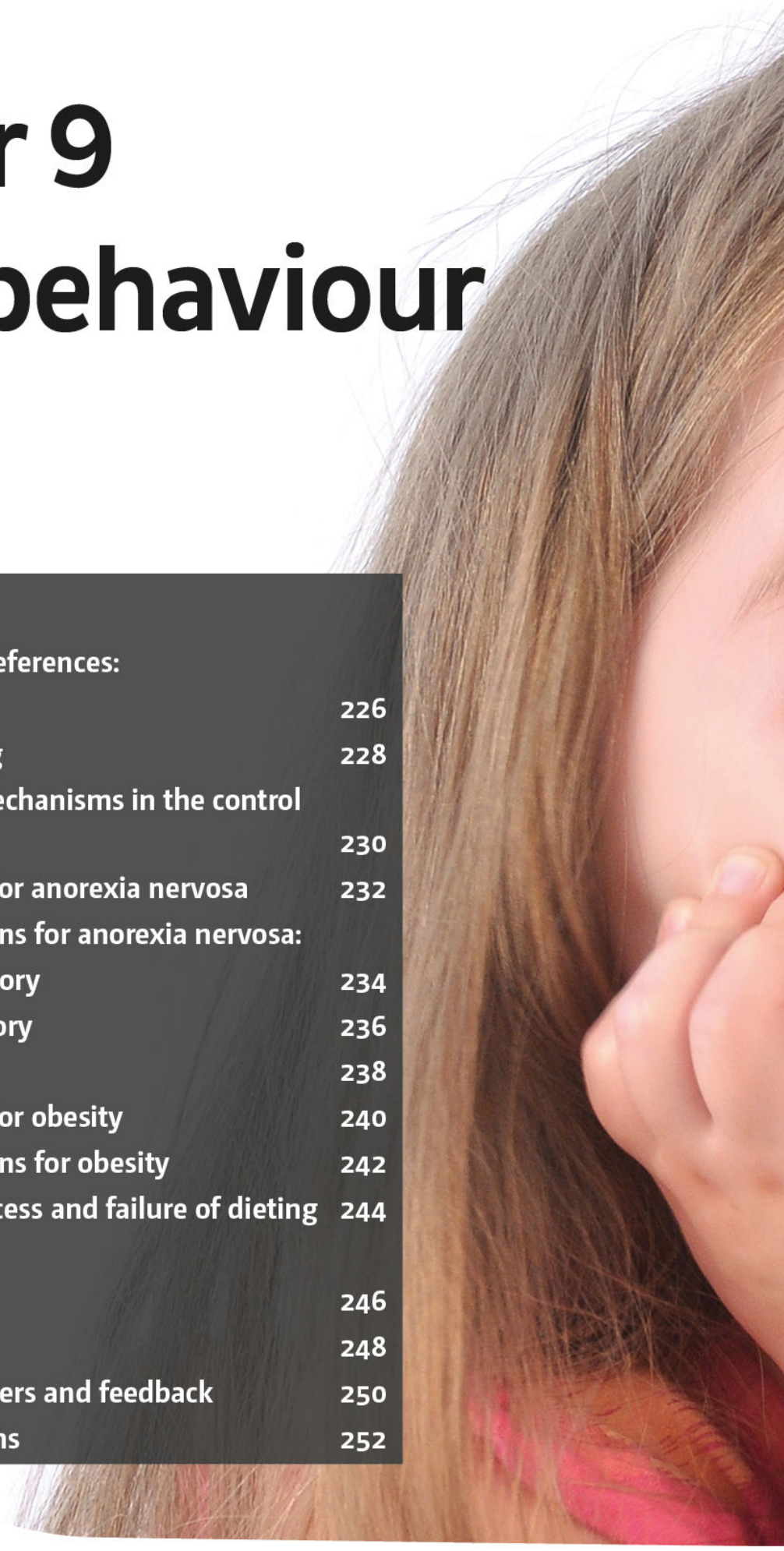
5. **Which best describes a modern understanding of schizophrenia diathesis?**
   (a) A schizogene and later trauma.
   (b) Multiple candidate genes.
   (c) Cannabis use and early trauma.
   (d) Multiple candidate genes and early trauma.

6. **Which of the following statements best describes the findings of the Tarrier *et al.* study of treatment combinations?**
   (a) Participants in the counselling + medication group did best overall.
   (b) Participants in both combination groups showed fewer symptoms and had fewer readmissions than the control group.
   (c) Participants in both combination groups showed fewer symptoms than the control group.
   (d) Participants in both combination groups had fewer readmissions than the control group.

MCQ answers

Introduction to schizophrenia 1A, 2B, 3C, 4B, 5D, 6B
Biological explanations for schizophrenia 1C, 2B, 3C, 4D, 5B, 6B
Psychological explanations for schizophrenia 1A, 2D, 3C, 4D, 5A, 6C
Biological therapy for schizophrenia 1A, 2B, 3C, 4D, 5D, 6D
Psychological therapy for schizophrenia 1C, 2D, 3C, 4A, 5B, 6C
Management of schizophrenia 1C, 2D, 3C, 4A, 5B, 6D
The interactionist approach to schizophrenia 1B, 2C, 3D, 4B, 5D, 6C

Chapter 9
Eating behaviour



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Not green stuff again!

Children definitely dislike certain foods. Which ones, and why?

Explanations for food preferences: Evolutionary

The specification says...

> Explanations for food preferences: the evolutionary explanation, including reference to neophobia and taste aversion.

There are two survival requirements that have to be balanced by evolutionary forces. One is the need for a varied diet high in energy and rich in essential nutrients such as fats and salt. The other is the need to avoid potentially toxic foods that threaten our survival and thus our chances of reproducing. Therefore humans and other animals have developed food preferences based on tastes that indicate energy sources and aversions to tastes that indicate toxins.

Key terms

Food preferences A desire for particular foods created because ancestral animals preferred to eat foods that were high in energy and low in toxins in order to increase their survival and reproductive chances.

Neophobia An innate predisposition to avoid anything new. An adaptive behaviour which reduces the risks of unfamiliar objects, experiences and activities until we learn they are safe.

Taste aversion An innate predisposition to learn to avoid potentially toxic foods, which are signalled by a bitter or sour taste.



Just what the doctor (or dentist) didn't order. Children have strong evolutionarily-determined food preferences. Here's one of them.

The evolutionary explanation

Preferences

The **evolutionary** argument is that any common **food preferences** we see today must exist because they provided an **adaptive** advantage. Those distant ancestors who had such preferences would have been more likely to survive and reproduce and thus we have inherited such preferences.

Preference for sweetness Food preferences are linked to sweet taste as it is a reliable signal of high-energy food. Jacob Steiner (1977) placed sugar on the tongues of newborn humans and found positive facial expressions (such as upturned mouth corners). Newborns can even distinguish between different sugars. Fructose is especially sweet and babies will consume large amounts of it if allowed. This makes sense in evolutionary terms. Fructose is a 'fast-acting' sugar providing energy quickly, and is present in ripe fruit, which would have been a favoured food for our distant ancestors.

Preference for salt A preference for salt taste appears in humans at around four months of age. Gillian Harris *et al.* (1990) found that babies between the ages of 16 and 25 weeks who had been breastfed preferred salted rather than unsalted cereal. Breast milk is low in salt, so this finding suggests that they had not learned a salt preference and that it is innate, even though it only appears months after birth.

Preference for fat High-calorie foods, such as fat, were not readily available to our evolutionary ancestors. So quickly learning to prefer foods which are high in calories would have carried a definite advantage because calories provide energy important for survival. As fat contains twice as many calories as the equivalent amount of protein or carbohydrate, a taste preference for fat is therefore the most efficient route to ensuring high energy food consumption. But this is not the only advantage of fat. It also contributes to *palatability* (making food taste pleasant).

Neophobia

Like most omnivores, humans have an innate unwillingness to eat new or unfamiliar foods. This food **neophobia** appears to be most pronounced in childhood, between the ages of about two and six years. Leann Birch (1999) suggests that it appears at a time when children begin to explore their environments and may encounter foods independently of their parents' guidance as to what is safe to eat and what isn't. Therefore, because untried foods are potentially dangerous to health, neophobia is adaptive because it means we are less likely to consume substances that could cause us illness or even prove fatal. Neophobia diminishes once we learn that specific foods will not poison us or cause us to become ill. Once it has served its purpose it is no longer needed and gives way to a different evolutionary mechanism that encourages consumption of a more varied diet, giving us greater access to important nutrients.

Taste aversion

According to Martin Seligman's (1971) theory of **biological preparedness**, we acquire certain **taste aversions** or fears more quickly than others. These are generally to objects or situations that posed the greatest threats to our distant ancestors' survival. Humans and other animals are therefore **genetically** hardwired to learn taste aversions that make us less likely to eat food that has gone bad or is toxic.

An example of this was provided by John Garcia and Robert Koelling (1966) who **classically conditioned** rats to acquire a taste aversion to sweetened water after pairing it with a poison, but they were much less successful when they paired the water with electric shocks. On the other hand, an aversion to light and clicking sounds was easily conditioned in another group of rats when these were paired with electric shocks, but not when paired with a poison. The researchers explained these findings in terms of preparedness, an evolutionary mechanism. A taste aversion is much more likely to be the outcome of eating poisoned food than it is of encountering a light or a clicking sound. It is an adaptive response that aids survival.

Bitter tastes in food are usually a reliable warning sign of toxins or that the food has gone off, so it is beneficial to survival to be able to detect these tastes quickly. In his research with newborn humans, Jacob Steiner (1977) found evidence of negative facial expressions (such as downturn of the corners of the mouth) in response to bitter tastes. This occurred before any learning of taste preference had taken place, strongly suggesting an innate mechanism at work.

Apply it Concepts — The 'picky' eater

Oscar is a two-year-old boy and a 'fussy' eater. He hates most vegetables and often pulls a disgusted face when he is given something to try for the first time. On the other hand, there are some foods Oscar likes to eat over and over again. He loves sweet and fatty foods, and his parents are worried that he is going to become obese when he grows up.

Question

How would you explain Oscar's eating habits to his parents? Refer in your explanation to the concepts of (a) food preferences and (b) neophobia.

Practical activity on page 246

Evaluation

Research support

One strength is that the evolutionary explanation for food preferences is supported by research studies.

For example, Susan Torres *et al*. (2008) reviewed relevant studies into the link between stress and eating behaviour. They concluded that humans have an increased tendency to prefer high-fat foods during periods of stress. At such times the **fight or flight response** is initiated. This is an evolved mechanism that helps us cope with stress but it creates greater demands for energy.

Therefore an increased fat preference during times of stress supports the view that such a preference is important for survival.

Neophobia no longer adaptive

One limitation of neophobia is that it is no longer adaptive in the modern food environment.

Most of the food we consume – at least in the developed world – is sold by retailers and food outlets that are subject to strict laws (e.g. hygiene, etc.). Food is therefore safer than it has ever been and offers little threat to survival. Caution about trying new foods in childhood (neophobia) used to protect us from sickness and death, but it now merely prevents us from eating safe foods from a young age.

Therefore neophobia restricts a child's diet, limiting access to a wider variety of safe foods that provide nutritional benefits.

Individual differences in taste aversion

Another limitation of evolutionary explanations is that we would expect all people to share the same adaptive food preferences – but they don't.

An example of this is the bitter-tasting chemical PROP (6-n-propylthiouracil). This chemical is often associated with foods that are potentially dangerous (e.g. it is a sign the food is 'off'). Adam Drewnowski *et al*. (2001) found that people differ in their ability to detect PROP which we would not expect if it was an adaptive ability. Furthermore, PROP insensitivity appears to be an inherited trait.

Therefore it seems that some adaptive preferences are not selected in the way we would expect according to evolutionary theory.

Counterpoint However there is evidence that PROP insensitivity is linked with other traits that may have offered our ancestors different survival benefits. Remarkably, some bitter compounds in foods such as soy products, green tea, red wine and grapefruit juice (flavonoids, polyphenols, etc.) may be protective against cancer. Therefore those individuals who do not detect bitterness are eating foods which provide other benefits.

This suggests that a preference for bitter foods in our evolutionary history could be an adaptive trait after all.

Evaluation eXtra

Cultural and evolutionary influences

According to Elizabeth Cashdan (1998), culture plays a major role in determining which foods are accepted and rejected. She gives the example of someone brought up in a Jewish Kosher household, who would probably be repulsed by the idea of eating a prawn cocktail.

However, evolutionary factors may also be at work. The fact that all (or most) cultures have many similar food preferences suggests there may be some underlying common basis to what is considered acceptable or unacceptable to eat. It is also true that food preferences seem to be a lot more difficult to change than other elements of a culture, such as style of dress. This points towards a deeper role for shared evolutionary factors.

Consider: *Which influences are more important in food preferences – cultural or evolutionary?*

Apply it Concepts

Eat up your veggies? No thanks.

Lena is 15 years old and finds the tastes of certain foods very unpleasant. In fact, her whole family shares her distaste of grapefruit juice, soy sauce, green vegetables, and plenty of other foods which make them all feel sick. Lena has often wondered what these foods have in common and why everyone in her family hates them.

Questions

1. What do you think these foods have in common?
2. How does the concept of taste aversion help us to understand Lena's family's eating behaviour?



Fat, salt, sugar, energy – all the food preferences of our evolutionary ancestors. But are they now slowly killing us?

Apply it Methods

Babies' loves (and hates)

A psychologist intended to conduct an observational study of the food likes and dislikes of young babies (aged between 16 and 24 weeks). She decided to carry out a pilot study of five babies' behaviours when they were given a sweet-tasting liquid and a bitter-tasting liquid. Two independent observers were used to observe these behaviours.

Questions

1. Suggest *three* **operationalised behavioural categories** the observers could use to identify taste-related behaviours. (*3 marks*)
2. Write an appropriate **directional hypothesis** for this study. (*2 marks*)
3. The observers recorded each taste-related behaviour as it occurred. Identify the **level of measurement** used and explain your answer. (*2 marks*)
4. What is a **pilot study** and why might one be useful in this research? (*3 marks*)
5. **Inter-observer reliability** was low in this pilot study. Explain what the researcher could do to improve it before carrying out the main **observational study**. (*3 marks*)

Check it

1. In relation to food preferences, explain what is meant by 'neophobia' and 'taste aversion'. *[2 marks + 2 marks]*
2. Outline evolutionary explanations for food preferences. *[6 marks]*
3. Evaluate neophobia as an explanation for food preferences. *[3 marks]*
4. Describe **and** evaluate evolutionary explanations for food preferences. *[16 marks]*

Explanations for food preferences: The role of learning

The specification says...

> Explanations for food preferences: the role of learning in food preference, including social and cultural influences.

We saw in the previous spread how we are born with innate food preferences and aversions, which may be evolutionarily and genetically determined. However, it would be a waste of valuable resources to have any fixed innate tendency to like or dislike many foods. This means that most of our preferences are acquired through experience, and there are several ways in which they can be learned.

Key terms

Social influences Behaviour related to social factors, such as family influences, peers and media advertising, and through processes of modelling and imitation (social learning theory).

Cultural influences 'Culture' refers to the norms and values that exist within any group of people.



Daddy draws the short straw … again. Providing role models for children can be a labour of love.

Apply it

Concepts A poor diet

Ellen and Tom think their children have picked up some bad eating habits at school. The children complain about the healthy food they get given at home. When they go to the supermarket, the kids always try to use their 'pester power' at the checkout. Ellen wonders if it's her fault because she eats crisps and sweets around the children.

Question

Identify the features of this scenario that highlight the following social influences: (a) family, (b) peers and (c) the media. For each, explain *one* way in which Ellen and Tom could help their children learn to make healthy food choices.

The role of learning in food preference

The process of learning: Classical and operant conditioning

One common form of **classical conditioning** is *flavour–flavour learning*. We develop a preference for a new food because of its association with a flavour we already like. Because of our innate preference for sweetness, we learn to prefer many new foods by sweetening them. For example, porridge and yoghurt both become immediately more acceptable after sugar is added to them. According to flavour–flavour learning principles, this association eventually leads to liking of the new food on its own.

In terms of **operant conditioning**, children are often directly **reinforced** for their food preferences, mainly by parents and older siblings. They provide the child with rewards for eating certain foods, in the form of encouragement or praise, or parents may even punish a child for not eating a food. However, it is still surprisingly difficult to establish a preference (e.g. for green vegetables) in children using rewards, which is why classical conditioning is probably the more powerful form of food preference learning.

Social influences

Social learning theory (SLT) This theory explains social influences in terms of **modelling** and **vicarious reinforcement**. Children will readily acquire the food preferences of **role models** they observe eating certain foods. This is especially so if the model appears to be rewarded (by showing obvious enjoyment or being praised by others), and if they are someone the child identifies with (e.g. a parent or teacher). This has an adaptive function because it ensures that children eat foods that are obviously safe because others are eating them without harmful effects. This is important because without this modelling toddlers can and do attempt to eat potentially dangerous foods (Shutts *et al.* 2013).

Family influences Social influences on the learning of food preferences are most obvious within the family and in childhood. Parents' food preferences have powerful effects on those of children, not least because parents are 'gatekeepers' of their children's eating.

Peer influences Leann Birch (1980) conducted a study in a preschool lunchroom. Each 'participant' child was placed next to three children who had different vegetable preferences from them. After four days, the participant children had changed their preferences (they switched from carrots to peas, or vice versa) in response to observing the other children – compared to a control group. This change was still evident after several weeks.

Media influences As children get older and more independent of their parents' food choices, other models outside the family become more important. An obvious example of this is television advertising. Young people who watch even a moderate amount of television encounter a significant number of adverts for foods generally considered 'unhealthy' (high in salt, sugar and fat). These adverts are often marked by 'fun'-related themes and the products themselves promoted by characters children identify with.

Cultural influences

According to Paul Rozin (1984) cultural influences are the single most significant predictor of food preference. According to Mette Vabø and Hårvard Hansen (2014), we learn our cultural 'rules' about eating around the family table about when, what and how much to eat. Culture determines to a large extent which foods we put on the table, and which our children are exposed to in the first place. These cultural rules are powerful enough to overcome innate aversions.

Cultural norms One powerful cultural influence on food preferences is ideals or norms. An example of this is attitudes towards what constitutes a 'proper meal'. For many of an older generation it has to include 'meat and two veg'. The 'rule' that the main Sunday meal had to be a roast dinner was a common ideal in many British households.

Meat-eating Many culturally determined food preferences centre around meat. There is a cultural tradition in France to eat most parts of an animal, which is why offal (kidneys, liver, heart, etc.) is a common preference there. However, most Americans consume a lot of meat in the form of steaks and the like, but they have a strong aversion to offal. Some cultural food traditions in India are almost entirely meat-free (e.g. in Rajasthan).

Culture and learning We associate (classical conditioning) many of the foods we eat and enjoy as adults with feelings of security and happy experiences growing up. They may be linked in memory to enjoyable special cultural occasions spent with friends and family, events nearly always marked by culturally specific food choices ('feasts'). Vicarious reinforcement plays a part too because culture influences which foods are given to children, and children see their cultural group enjoying these foods (rewarding).

Evaluation

Lack of support for classical conditioning

One limitation is that there is actually very little evidence for the role of classical conditioning in food preferences.

For example, Frank Baeyens *et al*. (1996) asked student participants to taste previously untried flavours. In the **experimental condition** of the study the flavours were paired with a sweet taste. A **control group** of students tried the new flavours paired with a neutral flavour (tasteless). There were no differences between the two groups in preferences for the new flavours after pairing.

This suggests that classical conditioning via flavour–flavour learning is at best an incomplete explanation of food preferences.

Counterpoint However, in the same study Baeyens *et al*.'s participants tasted previously untried flavours paired with Tween, a chemical (e.g. in washing-up liquid) that has a mildly soapy and bitter flavour. The students consistently rated the new flavours significantly lower than the control group (in which a tasteless substance was used). Most of the students formed a long-lasting aversion to the new flavours.

This suggests that classical conditioning does have a role in eating behaviour in terms of forming food aversions rather than preferences.

Support for social learning theory

One strength is research support for the role of social learning in food preferences.

Anita Jansen and Nienke Tenney (2001) gave children either an energy-dense or energy-dilute yoghurt drink the children had never tasted before. The most preferred taste was the energy-dense drink taken at the same time as a teacher who was also having the drink and praised the drink and showed clear signs of enjoyment. The researchers concluded that the children identified with the teacher so were more likely to model the teacher's preference and imitate their behaviour.

This research provides support for SLT both in terms of modelling (imitating behaviour) and vicarious reinforcement (children's preference influenced by the teacher's praise and enjoyment).

Role of culture

Another strength is evidence that cultural factors influence food preferences.

One of the biggest cultural changes in industrialised societies has been the increasing availability of food outside the home, such as fast food restaurants. This has accompanied a greater preference for foods of the type bought from fast food restaurants, i.e. foods that can be consumed quickly. The foods also tend to be high in fat, salt and sugar because people (especially children) have a preference for these foods – and, to increase sales, fast food restaurants focus on these. So people eat more and more fatty, salty, sugary foods.

This shows that wider cultural changes strongly influence the kinds of things that people eat.

Evaluation eXtra

Short- and long-term

Media can have powerful short-term effects on food preferences. Helle Hare-Bruun *et al*. (2011) studied a group of eight- to ten-year-old Danish boys and girls. They found that the children who watched the most television (programmes and adverts) also had the most unhealthy food preferences.

However this link was much weaker in a follow-up study of the same children six years later, as other factors (especially friends) influenced preferences more strongly.

Consider: *Are the effects of social learning on food preferences principally short-term or long-term?*

Apply it Concepts

A matter of tastes

Sophie and Sahal are comparing what they had for breakfast. Sophie had apricot jam on toast, something she has had for as long as she can remember. Sahal had canjeero, a bread that looks a bit like a pancake, with a goat stew. He explains how he used to have it with camel meat when he was growing up in Somalia.

Question

Explain at least *two* ways in which culture influences Sophie's and Sahal's breakfast preferences.



The family that eats together … we learn many of our food likes and dislikes around the meal table. But how long before this scene becomes a rarity?

Study tip

Social learning theory (SLT) features a lot in this book as an explanation for different behaviours. It is easy to write a general description of SLT, but you absolutely must avoid this. If you are writing about the role of learning in food preferences, you have to apply SLT concepts to this specific behaviour. Always **THINK LINK** (see page 360 for an explanation).

Apply it Methods

Questioning preferences

A team of health psychologists carry out interviews to help them understand how children learn food preferences. They recruit 20 children between the ages of eight and ten years. Each child is given a 20-minute interview, in which they are asked a mixture of closed and open questions about their food likes and dislikes.

Questions

1. Explain *two* differences between a **structured** and an **unstructured interview**. (*2 marks + 2 marks*)
2. Write *one* example of an open question and *one* example of a closed question suitable for this study. (*2 marks + 2 marks*)
3. Identify *one* sampling technique the psychologists could use to recruit the children, and explain how they could do so. (*1 mark + 2 marks*)
4. Explain *one* reason why the psychologists thought interviews might be better than **questionnaires** in this study. (*2 marks*)
5. Explain *one* **ethical issue** that could arise in this study and how the psychologists could deal with it. (*2 marks + 2 marks*)

Check it

1. Outline social **and/or** cultural influences on the learning of food preferences. *[6 marks]*
2. Outline what research has found about the role of learning in food preferences. *[6 marks]*
3. Explain **two** criticisms of cultural influences on the learning of food preferences. *[6 marks]*
4. Describe **and** evaluate the role of learning in food preferences. *[16 marks]*

Neural and hormonal mechanisms in the control of eating behaviour

The specification says...

Neural and hormonal mechanisms involved in the control of eating behaviour, including the role of the hypothalamus, ghrelin and leptin.

Eating is such a central feature of human behaviour. It is bound up with all sorts of cultural traditions, psychological motives and social activities but perhaps most of all it provides the body with energy and the means for survival. Therefore it is not surprising that the controlling mechanisms of this behaviour should be deeply rooted in our biology.

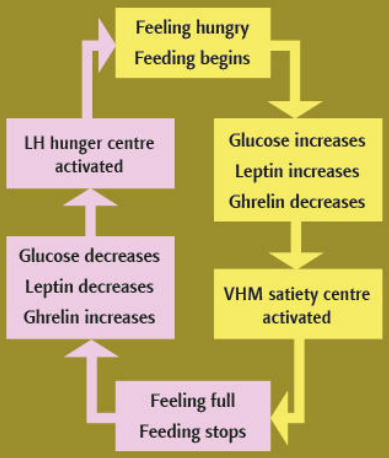
Key terms

Hypothalamus A small subcortical brain structure made up of two centres – the lateral hypothalamus (LH) and the ventromedial hypothalamus (VMH).

Ghrelin A hormone produced by cells in the stomach wall which acts as a powerful appetite stimulant, contributing to the 'on switch' of eating behaviour.

Leptin A hormone produced by adipose (fat) cells which acts as a powerful appetite suppressant, contributing to the 'off switch' of eating behaviour.

The dual-centre model.



Apply it Concepts Rat studies

Mauricio Russek (1971) starved rats before giving them an opportunity to feed. Injecting glucose directly into their livers stopped them feeding. Philip Teitelbaum (1955) created lesions in the hypothalamuses of rats and found that this caused them to overeat.

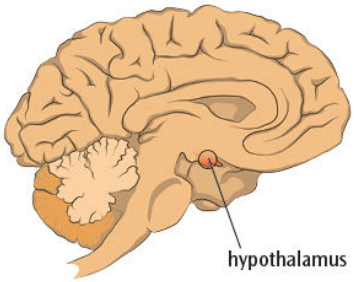
Question

Which study demonstrates the role of:
(a) The lateral hypothalamus?
(b) The ventromedial hypothalamus?

Explain your answers.

Neural and hormonal mechanisms

The role of the hypothalamus



The **hypothalamus**, a subcortical structure of the brain, has a crucial role in integrating the **nervous** and **endocrine systems**. It is also involved in maintaining **homeostasis**, the balancing of bodily processes within certain limits. This biological mechanism regulates the level of glucose in the blood. Glucose is the most basic of sugars and the body's main source of energy. Fluctuations in blood glucose concentration are first of all detected by glucose-sensing **neurons** in the hypothalamus. The hypothalamus can then regulate glucose levels by influencing the output of insulin and anti-insulin hormones, e.g. glucagon (Chan and Sherwin 2012). Insulin and glucagon are secreted from the pancreas and play a key role in maintaining blood glucose homeostasis within a narrow range of values.

The dual-centre model of eating behaviour

Two areas of the hypothalamus provide homeostatic control over blood glucose levels.

Lateral hypothalamus (LH) Often described as the 'feeding centre' or 'on switch' of the hypothalamus, the LH contains cells that detect levels of glucose in the liver. The LH is activated when glucose levels fall below a certain level. This causes an individual to become hungry and triggers the motivation to eat, along with accompanying behaviours such as searching for and preparing food.

A further neural mechanism associated with LH activity is the secretion of a hypothalamic **neurotransmitter** called *neuropeptide Y* (NPY), which is closely associated with hunger and a reduction in physical activity. NPY is a powerful stimulant of hunger. Rats injected with NPY directly into the hypothalamus will eat excessively and eventually become obese as the injections continue.

Ventromedial hypothalamus (VMH) This part of the hypothalamus is the 'satiety centre', the 'off switch' of eating behaviour. Eating food provides the body with glucose, so the levels of glucose circulating in the bloodstream and stored in the liver (as glycogen) rise once again. These levels are detected by cells in the VMH. Activity in the VMH is then triggered once glucose levels increase past a set point. LH activity is inhibited at the same time. The individual becomes satiated – they feel full and stop eating.

Damage to the VMH is linked with continued eating past the point of satiety. Alexander Reeves and Fred Plum (1969) reported the case of a woman whose weight more than doubled in a two-year period. A **post-mortem** investigation revealed that she had a tumour on her VMH, which caused its normal 'stop eating' function to fail.

The role of ghrelin

Ghrelin is a hormone secreted by the stomach. It is a **hormonal** marker of how long since we have last eaten because the amount produced is closely related to how empty our stomach is – more ghrelin is released the longer we go without food. Ghrelin levels are detected by receptors in a part of the hypothalamus called the *arcuate nucleus*. When levels rise above a set point, the arcuate nucleus sends signals to the lateral hypothalamus to secrete NPY (see above).

Ghrelin is now known to be an appetite stimulant in humans. Alison Wren *et al.* (2001) found that given intravenously, ghrelin caused a short-term increase in the amount of food eaten. The amount of ghrelin circulating in the bloodstream is closely correlated with subjective feelings of hunger.

The role of leptin

Leptin is a hormone produced by adipose (fat) cells. Levels of leptin in the blood increase along with fat levels, and these are detected in the brain by the VMH. As leptin is an appetite suppressant, it contributes to the VMH satiety mechanism outlined above. Once levels increase beyond a set point, the individual feels full and stops eating. Julio Licinio *et al.* (2004) studied an extremely rare **genetic** condition in which individuals are unable to produce leptin naturally. This condition is associated with severe obesity. Treatment involves leptin-replacement therapy, and over an 18-month period the researchers found that this led to an average weight loss of more than 40% and a reduction in food intake initially of 49%.

Evaluation

Research support for dual-centre model

One strength is support for the dual-centre model from lesion studies with rats.

In such studies, surgical wounds (lesions) are created in various strategic brain areas. For example, Albert Hetherington and Stephen Ranson (1942) showed that lesioning the VMH of rats caused these animals to become *hyperphagic* (overeat) and eventually severely obese. Bal Anand and John Brobeck (1951) lesioned the LH of rats and the outcome was *aphagia* (a cessation of all eating behaviour and starvation).

This illustrates the homeostatic nature of the mechanism – two brain centres with opposing functions, as predicted by the model.

Counterpoint However, there are issues with lesioning studies. A major one involves the surgical procedure itself – it is not always precise enough to produce a lesion limited to one brain area (e.g. the VMH or LH). Richard Gold (1973) pointed out that other brain areas are often damaged as well. The findings of Hetherington and Ranson's study came about because another part of the rat hypothalamus was also lesioned, the paraventricular nucleus (PVN). According to Gold, when lesions really are limited to the VMH they do not produce hyperphagia.

This suggests that physiological control of eating behaviour may involve more than two brain centres.

Oversimplified models

One limitation is that the models involving the hypothalamus, ghrelin and leptin are oversimplified.

Elana Valassi *et al*. (2008) highlight the role of a hormone called *cholecystokinin* (CCK), produced in the duodenum (upper intestine). It activates the nerve that sends signals from the gastrointestinal tract to the hypothalamus. These signals indicate satiety and contribute to the 'stop eating' mechanism. So CCK may be an even more powerful appetite suppressant than leptin. Several other biochemicals are involved (e.g. **serotonin** and **dopamine**) and they interact to either enhance or inhibit each other's activities.

This shows that the true nature of neural and hormonal control of eating behaviour is extremely complex.

Social and cultural factors underplayed

Another limitation is that a purely homeostatic view underplays social and cultural influences.

According to Stephen Woods (2004), the view that the LH feeding centre always detects falls in blood glucose levels and stimulates hunger is outdated. In fact, this only occurs in 'emergency' conditions of severe energy deprivation. In 'normal' everyday eating, neurochemistry plays a much lesser role. Onset of eating is more controlled by social and cultural factors related to lifestyle (e.g. the timing of eating is influenced by traditional mealtimes).

This suggests a biological approach to understanding eating behaviour ignores potentially important nonbiological factors that may be more influential.

Evaluation eXtra

Animal research

Neural and hormonal mechanisms controlling eating behaviour in non-human animals and humans are very similar (e.g. hypothalamus, leptin, ghrelin). As much of the research on this spread shows, most of what we know about these mechanisms comes from animal research (e.g. lesion studies of rats).

However, eating behaviour in humans is more complex than in rats. It is influenced by social, cultural and psychological factors not considered in animal studies.

Consider: *To what extent can animal studies help us understand human eating behaviour?*

Apply it Concepts — Jed's struggle

Jed has always struggled with his weight and has been diagnosed as diabetic. As dieting has never worked, Jed's doctor has recommended he consider having a gastric band fitted, which would limit the amount of food he can eat and change his biochemistry so he feels less hungry. But Jed is not convinced that his problem is biological and would like to know more.

Question

Use your knowledge of eating behaviour to outline why Jed might be right.



Do I look big in this? Zucker rats are bred to be obese for research into diabetes and the effects of ghrelin, leptin and other biological mechanisms.

Apply it Methods — Fat rats

A researcher was interested in how the eating behaviour of rats is controlled by hormones. He allowed two groups of rats to feed freely, and measured the quantity of food eaten. One group of the rats had been selectively bred to be deficient in leptin. The other rats had normal leptin functioning. The researcher found that in a single feeding session, the leptin-deficient rats ate significantly more than the other group.

Questions

1. Identify the **operationalised IV** and **DV**. (*1 mark + 1 mark*)
2. Identify and explain the type of **experimental design** used in this study. (*1 mark + 2 marks*)
3. Explain *one* strength and *one* limitation of this design in the context of this study. (*2 marks + 2 marks*)
4. Explain what is meant by **validity**. (*2 marks*)
5. Explain why this experiment might be lacking in validity. (*3 marks*)

Study tip

Neural and hormonal mechanisms are both biological concepts and are easy to mix up. Remember that 'neural' refers to the involvement of the brain and nervous system, so includes the hypothalamus. 'Hormonal' is about chemical messengers and includes the roles of ghrelin and leptin.

Check it

1. Outline the role of the hypothalamus in the control of eating behaviour. *[6 marks]*
2. Outline the roles of ghrelin **and** leptin in the control of eating behaviour. *[6 marks]*
3. Describe neural mechanisms involved in the control of eating behaviour. *[6 marks]*
4. Discuss some of the neural **and** hormonal mechanisms involved in the control of eating behaviour. *[16 marks]*

Biological explanations for anorexia nervosa

The specification says...

Biological explanations for anorexia nervosa, including genetic and neural explanations.

Anorexia nervosa (AN) is a devastating and life-threatening eating disorder that is estimated to affect between 0.3% and 1.2% of the population at any one time, with a female to male ratio of about nine to one. AN is defined by many symptoms, including a refusal to eat, intense dieting, a pathological fear of gaining weight, a distorted body image, self-disgust and food-related anxiety.

It is this bewildering range of symptoms that makes AN so difficult to explain from just one perspective. We begin our four-spread exploration of AN by considering two prominent biological explanations.

Key terms

Genetic explanation Genes consist of DNA strands. DNA produces 'instructions' for general physical features of an organism (such as eye colour, height) and also specific physical features (such as neurotransmitter levels and size of brain structures). These may impact on psychological features (such as intelligence and mental disorder). Genes are transmitted from parents to offspring, i.e. inherited.

Neural explanation Any explanation of behaviour (and its disorders) in terms of (dys)functions of the brain and nervous system. This includes the activity of brain structures such as the hypothalamus, and neurotransmitters such as serotonin and dopamine.

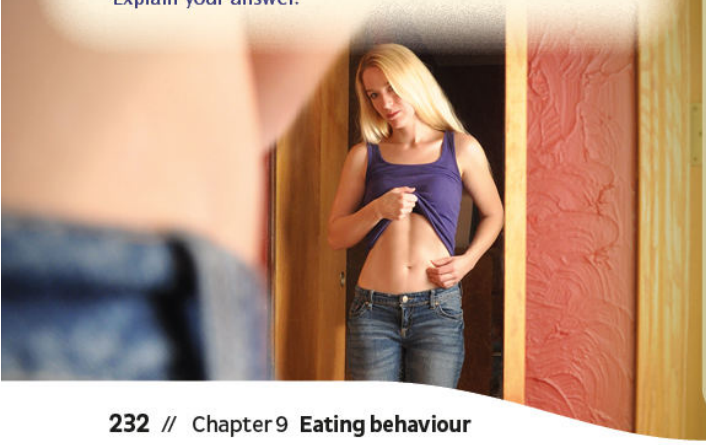
Apply it Concepts

Badiha and her mum

Badiha is 16 years old and has lost a lot of weight in the past six months. Her behaviour around food has also changed. Badiha's mum had been diagnosed with AN when she was the same age.

Questions

1. What does research say about the likelihood of Badiha's behaviour being influenced by genes?
2. Even if anorexia runs in Badiha's family, does this mean that she will inevitably develop the disorder herself? Explain your answer.



Genetic explanation for anorexia

Anorexia runs in families

Evidence for the genetic explanation of **anorexia nervosa** (AN) comes from **twin studies** of **MZ** (identical) and **DZ** (non-identical) twins. The **concordance rate** indicates the proportion of twin pairs in which both individuals have AN, relative to pairs in which only one individual has it. As MZ twins share 100% of their genes but DZ twins only 50% (on average), a higher concordance rate for MZs is strong evidence of a genetic component to AN.

Anthony Holland *et al.* (1988) studied 45 pairs of female twins (and one set of triplets). They found a concordance rate of 56% for MZ twins but only 5% for DZs. Other studies have found smaller differences but still provide strong evidence for the role of genes.

Candidate genes

Researchers look for genes that may be involved in causing anorexia, and there are many candidates. Ashley Scott-Van Zeeland *et al.* (2014) carried out a *candidate-gene association study* (CGAS). They compared 1205 people with AN and 1948 control participants by sequencing 152 candidate genes suspected to be linked with features of AN. They discovered that only one gene was **significantly** associated with AN – *epoxide hydrolase 2 (Ephx2)*. It codes for an enzyme involved in cholesterol metabolism. Surprisingly, many people in the acute phase of AN, when symptoms are particularly severe, do have abnormally high levels of cholesterol.

Genome-wide association studies

Genome-wide association studies (GWAS) offer a different approach because they do not make assumptions about which genes *might* be involved in anorexia. They look at the entire collection of human genes rather than just individual ones. GWAS of anorexia are rare. Vesna Boraska *et al.* (2014) conducted one with 5551 people with AN and 21,080 **matched controls** – 72 separate genetic variations were identified, but none of them were significantly related to AN. However, the researchers argued that this was not because genetic influences on AN are non-existent. Rather, it was because their study was not sensitive enough to detect them.

Neural explanation for anorexia

The most direct and well-evidenced neural explanation of AN is in terms of **neurotransmitters**, especially **serotonin** and **dopamine**. Neurotransmitter levels in the nervous system are not studied directly – instead researchers measure levels of metabolites (chemical byproducts) instead. The main metabolite of serotonin is *5-HIAA* (5-hydroxyindoleacetic acid) and the main metabolite of dopamine is *HVA* (homovanillic acid).

Serotonin

Research has established the involvement of serotonin in many behaviours that are features of AN (such as appetite reduction and obsessiveness). In a review article, Ursula Bailer and Walter Kaye (2011) present evidence of low levels of 5-HIAA in people with AN. These levels return to normal after short-term weight recovery, and increase beyond normal levels after long-term recovery.

Evelyn Attia *et al.* (2014) studied individuals with AN who had not returned to their pre-illness weight. These individuals responded less well to drugs that stimulate serotonin activity (serotonin agonists) than people with AN who had restored a healthy weight.

The pattern of results from these studies clearly indicates underactivity of the serotonin system in AN.

Dopamine

Using metabolites as a measure of dopamine levels, Walter Kaye *et al.* (1991) found lower HVA levels in recovered AN patients compared with controls. This suggests lowered levels of dopamine are associated with AN.

Another approach was used by Ursula Bailer *et al.* (2012), injecting participants with amphetamine, a drug known to increase dopamine. Control participants with no history of eating disorders experienced euphoria (pleasure) associated with dopamine increase. But the participants with AN experienced anxiety instead.

We know that eating increases dopamine release, therefore people with AN may restrict their food intake to reduce their anxiety levels.

Evaluation

Limitation of twin studies

One limitation of the genetic explanation is that twin studies may lack validity.

In every pair, twins share the same environment as each other (because each pair is raised together). But do DZ twins share their environment to the same extent that MZ twins share theirs? We assume they do (the *equal environments assumption*). However, the assumption may be wrong because one aspect of the environment is the way twin pairs are treated by others. MZ twins are treated very similarly by parents, friends, etc. because they look identical and act in similar ways. DZs are treated in less similar ways.

This means that genetic influences on AN may not be as great as twin studies suggest.

Polygenic basis

One strength is that gene studies have highlighted the true genetic nature of AN.

Ironically, this is because such studies have been unsuccessful in identifying the genes that contribute to AN. Many candidate genes have been put forward only to 'fall by the wayside' in later research. The main contribution of these studies is to show that the search for a single gene is futile. It is widely accepted that no one gene can be responsible for the wide variety of physical and psychological symptoms that characterise AN, such as appetite loss, body image distortions and fear of weight gain.

Therefore gene studies have shown that AN is polygenic – many genes make important but modest contributions to the disorder.

Evaluation eXtra

Diathesis-stress

Genes lay the foundation for AN as shown by research on candidate genes. This creates a *diathesis* (a predisposition) that makes them more likely to develop AN.

However, whether the diathesis gives rise to AN depends on the presence of a stressor (thus **diathesis-stress**). Many stressors are environmental, such as trying to lose weight because you experience feelings of low self-esteem. Many stressors can be controlled in order to reduce the likelihood of developing AN.

Consider: *Do you think genes or environment ultimately makes the more important contribution to AN?*

Evaluation

Research support

One strength is research evidence to support the role of dopamine dysfunction in AN.

Many studies have tested cerebrospinal fluid (CSF) for HVA. Walter Kaye *et al.* (1999) compared women diagnosed with AN (and who were severely underweight) with women who had no history of eating disorders (controls). The HVA levels of the women with AN were 30% lower than for the non-AN women, on average.

These findings strongly suggest that a disturbance of dopamine metabolism may contribute to the symptoms of AN.

Oversimplistic

One limitation is that neural explanations can be simplistic.

Ken Nunn *et al.* (2012) argued that serotonin on its own does not distinguish between people who have AN and those who do not. AN is better explained by considering the interaction between serotonin and another neurotransmitter – **noradrenaline**. The researchers claim that other neurotransmitters (e.g. **GABA**) are also involved.

This is an important reminder that neurotransmitter systems do not operate in isolation, but in complex interactions.

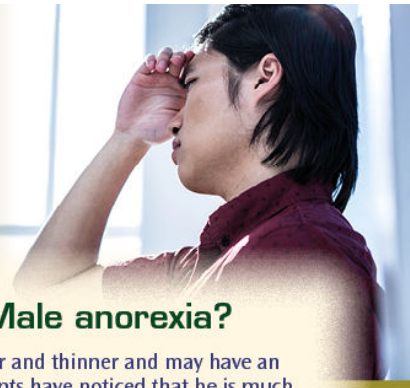
Evaluation eXtra

Drug treatments

Drug treatments targeting low levels of serotonin and dopamine may help reduce AN symptoms (e.g. SSRIs developed to treat depression increase serotonin). Current drugs may also help recovered individuals to avoid relapse (e.g. 63% did not relapse after one year compared with 16% not taking SSRIs, Kaye *et al.* 2001).

However, no drug has been consistently successful in treating AN. One explanation is that AN may be caused by *high* levels of serotonin and dopamine (rather than low).

Consider: *Is continuing research into drug treatments for AN justified?*



Apply it Concepts — Male anorexia?

Jackson is getting thinner and thinner and may have an eating disorder. His parents have noticed that he is much more anxious these days. His appetite is non-existent and he is becoming more and more obsessive.

Questions

1. Referring to (a) serotonin and (b) dopamine, what features of Jackson's behaviour might indicate problems of neural functioning?
2. Some **antidepressant** drugs work by boosting levels of serotonin and dopamine. Explain how they might help Jackson.

Apply it Methods — A study of twins

A psychologist decided to conduct a study into eating behaviours. She recruited a volunteer sample of 10 pairs of identical twins. Each participant completed the *Restrained eating questionnaire* (REQ), made up of 10 questions (for example, 'Do you feel guilty after overeating?'), each with a 4-point scale (going from 1 to 4 where 1 represented 'never' and 4 represented 'always'). Each participant was given an overall score between 10 and 40, with a higher score indicating more restrained eating. The psychologist was interested in the degree of relationship between the twins in their scores.

The results of the study are given in Table 1 below.

Table 1 Restrained eating scores for 10 twin pairs.

Pair	Twin 1	Twin 2	Pair	Twin 1	Twin 2
1	32	38	6	29	31
2	26	20	7	10	14
3	37	29	8	30	26
4	18	12	9	15	17
5	14	34	10	18	15

Questions

1. Sketch a **scattergram** of the data in Table 1. Give it an appropriate title and label the axes carefully. (*3 marks*)
2. Discuss what the table of results and the graph you have sketched show about the relationship of the twin pairs' eating behaviours. (*3 marks*)
3. Identify an appropriate **statistical test** the researcher could use to analyse the data. (*1 mark*)
4. Give *two* reasons why this would be an appropriate test to use. (*2 marks*)

Check it

1. Outline what research has found about the role of genetics in anorexia nervosa. *[6 marks]*
2. Outline the neural explanation for anorexia nervosa. *[6 marks]*
3. Evaluate the genetic explanation for anorexia nervosa. *[6 marks]*
4. Describe **and** evaluate **one or more** biological explanations for anorexia nervosa. *[16 marks]*

Psychological explanations for anorexia nervosa: Family systems theory

The specification says...

Psychological explanations for anorexia nervosa: family systems theory, including enmeshment, autonomy and control.

Salvador Minuchin and his colleagues developed a psychodynamic theory of anorexia which focuses on the role of the family as a complex social system. According to the family systems theory (FST) of eating disorders, interactions within the family centre around one member's symptoms. This is adaptive because it distracts attention away from their many interpersonal conflicts.

Key terms

Family systems theory A psychodynamic explanation that views dysfunctional family interaction as a major factor in the development and maintenance of anorexia nervosa (AN).

Enmeshment Members of an anorexic family are over-involved and overprotective. Their self-identities are bound up with each other. Roles are poorly defined and there is little privacy.

Autonomy Our experience of freedom in deciding how we should behave, and degree of independence from others.

Control The experience of being in charge of one's own self and behaviour. People with anorexia nervosa are thought to struggle against family dependence for control, as they also do for autonomy.



According to family systems theory, an 'anorexic family' is one in which the style of interactions leads to one or more children developing anorexia. Therefore the 'cause' of the anorexia lies in the family and not in the individual.

Apply it Concepts

Applying the theory to therapy

Ruby has recently been diagnosed with AN. She is 19 years old but weighs just 40 kilos and has a body mass index of 13.5. Her weight has now been stabilised and she is seeing a therapist. The therapist suspects that Ruby's family relationships may be involved in her AN and wants to find out more.

Question

Write some questions the therapist could ask Ruby to find out if her anorexia is linked to the following: (a) enmeshment, (b) overprotectiveness, (c) rigidity, (d) conflict avoidance, (e) lack of autonomy, (f) lack of control.

Family systems theory

Salvador Minuchin *et al.* (1978) identified four main features of what they called a typical *anorexic family*. Because **anorexia nervosa** (AN) overwhelmingly affects females more than males, **family systems theory** (FST) focuses on the relationship between daughter and mother when being used to explain AN.

1. Enmeshment

Members of anorexic families are overly involved with each other. This comes about because boundaries within the family are 'fuzzy', the result of poorly defined roles and a lack of leadership. Family members spend a lot of time together and impinge on each other's privacy. They assume they know what each other is thinking. Families become **enmeshed** because the self-identities of each member are all tied up with one another. An adolescent daughter in an anorexic family faces the challenge of asserting her independence and differentiating her identity from everyone else's, especially her mother's. One way for the adolescent to assert her independence is by refusing to eat.

2. Overprotectiveness

Family members nurture each other obsessively, in a way that reinforces family loyalty and leaves no room for independence. Mara Palazzoli (1974) described how the mother of a daughter with AN in an enmeshed family felt, that all the decisions she made were for the benefit of her daughter and not for herself. This may sound admirable, but of course it makes it much easier to blame the daughter with AN when things go wrong.

3. Rigidity

Interactions within the anorexic family are extremely inflexible. Members deny the need for change and work hard to maintain things as they are. Problems arise when circumstances change, due to some internal pressure or external threat. The family is too rigid to adapt and is thrown into a crisis. For example, an adolescent daughter seeking greater independence cannot be accommodated. The rest of the family – particularly the mother – moves to quash this attempt at self-differentiation, giving the daughter no room for manoeuvre. The outcome is sometimes AN.

4. Conflict avoidance

The priority of the anorexic family is to avoid conflict or suppress it if it occurs. For instance, there can be no discussion of any issues where a difference of opinion might arise. As these issues are often problems of one kind or another, this means that they are not resolved and continue to fester until a crisis develops. So the daughter with AN starves herself, as the family refuses to accept there is anything to discuss.

Autonomy and control

The psychoanalyst Hilde Bruch (1978) suggested that anorexia is caused by the adolescent daughter's struggle to achieve the **autonomy** and **control** she craves. The mother in particular is domineering, intrusive, and does not accept her daughter's need for independence.

One outcome of this is confusion in the daughter, which expresses itself in three major symptoms of AN: a distorted body image, an inability to identify internal body states such as hunger, and an overwhelming feeling of a loss of control. The self-starvation that is central to AN is, according to Bruch, a desperate attempt by the daughter to control her self-identity as someone independent of the family. She controls her destiny by controlling her body, and weight loss is the visible measure of her success – the thinner she gets, the greater her degree of control.

Evaluation

Research support

One strength is there is support for FST from research studies.

Jaine Strauss and Richard Ryan (1987) compared women aged 16–31 years diagnosed with AN with healthy controls. They found that the individuals with AN demonstrated greater disturbances of autonomy than the controls. They had a more controlling and rigid style of regulating their own behaviour. They also differentiated less clearly between themselves and other family members (i.e. they were enmeshed) and they perceived poorer communication within their families.

These findings show that desire for autonomy, rigidity and enmeshment may be risk factors for AN in women.

Counterpoint However, these specific findings have been challenged by other research. For example Massimiliano Aragona *et al.* (2011) studied the families of 30 Portuguese women being treated for eating disorders (including AN). The researchers found that these families were no more enmeshed or rigid than a sample of non-eating disordered families. These contradictory findings may be due to issues with FST concepts. Enmeshment, rigidity and autonomy are vague, which means they are defined differently from one research study to another, leading to contrasting conclusions.

This means that it is difficult to find conclusive support for FST theory, and ultimately it is not a scientific theory because the concepts cannot be tested.

Therapy application

Another strength is evidence that therapies based on FST have had some success in treating AN.

Behavioural family systems therapy (BFST) attempts to disentangle family relationships, encourage a person with AN to interact more with people outside the family circle, and reduce parental control over eating. Arthur Robin *et al.* (1995) tested the effectiveness of this therapy on a small sample of 11 young women with AN and their families. The treatment lasted 16 months, at the end of which six of the participants with AN were considered 'recovered'. Another three recovered after a one-year follow-up period.

This suggests that FST concepts may have some practical value.

Mediating factors

One limitation is that links between family interaction and AN depend on other factors.

These are called *mediating factors* because they 'come between' (mediate) family influences and AN. For instance, Caroline Davis *et al.* (2004) found that family interactions affected eating disorders only in adolescents with high levels of anxiety. Other studies (e.g. Young *et al.* 2004) have shown that family factors have no significant effect on eating disorders in cases where there is no depression and no peer influences. This means anxiety, depression and peer influences must be mediating factors i.e. they determine whether or not family factors will affect the course of AN.

These mediating factors are mostly independent of family factors which shows that family factors alone cannot explain AN.

Evaluation eXtra

Validity of FST

FST can explain two features of AN that other theories struggle to account for. One is the tendency of AN to first appear in adolescence (at a time when young people are asserting their autonomy). The other feature explained by FST is the greater incidence of AN in girls/women compared with boys/men (by a ratio of up to 9 to 1).

However, it follows from this that FST has difficulty explaining the existence of AN in non-adolescent girls/women and boys/men. Furthermore, FST almost completely ignores the role of fathers in family dysfunction.

Consider: *On this basis, how useful is FST as a valid explanation of AN?*

Apply it Concepts — Striving for control

Anoushka's family do lots of things together, which Anoushka enjoyed when she was a child but not now that she's 16. Her parents always want to know what she's doing and where she's been. She wants to wear the clothes that she likes but her mum won't let her. Anoushka has a sign on her bedroom door saying 'authorised personnel only' but that doesn't stop her mum from coming in whenever she feels like it. She seems to know more about Anoushka's friends than Anoushka does.

Question

What aspects of this scenario suggest that Anoushka could be at risk of developing AN? Explain how in terms of family systems theory.



Family systems theory (FST) suggests that AN may be the result of a mother's attempts to thwart her daughter's desire for autonomy.

Apply it Methods — A case of anorexia

A psychologist carried out a case study into the family of a 17-year-old woman with AN. She used various techniques for collecting data about interpersonal relationships and interactions within the family.

Questions

1. Describe *one* technique that the psychologist could have used to collect data in this **case study**. (*2 marks*)
2. The study gathered a lot of **qualitative data**. Explain what is meant by 'qualitative data'. (*2 marks*)
3. Outline *one* strength of gathering qualitative data in this study. (*2 marks*)
4. The psychologist wrote up the case study in a report for publication in a scientific journal. What is the purpose of the **discussion** section of such a report? (*2 marks*)
5. How could the psychologist maintain her participants' **confidentiality** when her report is published? (*3 marks*)

Check it

1. In relation to the family systems theory of anorexia nervosa, explain what is meant by 'enmeshment' **and** 'autonomy'. *[2 marks + 2 marks]*
2. Describe what research has found concerning the roles of autonomy **and** control in the family systems theory of anorexia nervosa. *[6 marks]*
3. Outline the family systems theory of anorexia nervosa. *[6 marks]*
4. Discuss family systems theory as an explanation for anorexia nervosa. *[16 marks]*

Psychological explanations for anorexia nervosa: Social learning theory

The specification says...

Psychological explanations for anorexia nervosa: social learning theory, including modelling, reinforcement and media.

Our second psychological explanation of anorexia nervosa is Albert Bandura's social learning theory (SLT). Two major learning processes are operating in SLT – observational learning and vicarious reinforcement. A useful feature of this explanation is that it can explain media effects – SLT recognises that in the right circumstances, it is not only people we meet in real life whose behaviour can be imitated but celebrities and even fictional characters as well.

Key terms

Social learning theory (SLT) A way of explaining behaviour that includes both direct and indirect reinforcement, combining learning theory with the influence of cognitive factors.

Modelling From an observer's perspective, modelling is imitating the behaviour of a role model. From the role model's perspective, modelling is the precise demonstration of a specific behaviour that may then be imitated by an observer.

Reinforcement A consequence of behaviour that increases the likelihood of that behaviour being repeated. Can be positive or negative.

Media Communication channels, such as TV, film and books, through which news, entertainment, education and data are made available.



Role models?

Apply it Concepts

Heather's role models?

Heather's mum has always been slim and puts it down to 'natural good genes'. But as Heather has grown older, she's noticed that her mum rarely eats even at mealtimes. Heather's older sister also eats very little. Her sister and her mum often comment on one other's appearance, praising each other for losing weight and offering the latest dieting tips.

Question

Explain how Heather may be at risk of developing AN, using the concepts of (a) modelling, (b) identification and (c) vicarious reinforcement.

Social learning theory

Modelling

According to **social learning theory** (SLT), **anorexia nervosa** (AN) can be acquired indirectly, through observation of a model (i.e. **modelling**), an individual who provides a 'template' for behaviour that the observer can imitate. The model can exist in real life, such as a family member, or they can be symbolic, for example a cartoon character. Models are influential because they modify **social norms** by establishing what is acceptable or usual behaviour in a situation. For example, a child observing an older sibling constantly restricting her food intake may learn that this behaviour is 'normal'.

Models are especially influential if a child identifies with the model. Perhaps the child respects the model or perceives them as successful or glamorous and associates the model's thinness with these desirable characteristics.

Vicarious reinforcement

In addition to identification, SLT suggests that the likelihood of imitation depends mainly on observing the positive or negative consequences of that behaviour. So if a model is rewarded, for example by being praised for losing weight, this makes imitation more likely because the observer receives **reinforcement** indirectly (or vicariously).

Family members are major sources of vicarious reinforcement because observation of a behaviour is not a one-off occurrence but is repeated frequently over time. A child will probably observe many instances of food restriction being rewarded.

Role of the media

The **media** provides a rich source of symbolic models, and is a powerful transmitter of cultural ideals about body shape and size. Music videos, magazines, websites and television all communicate images of the ideal body shape for women (and increasingly for men). This ideal has become thinner and thinner, to the point that Size Zero was often presented as a body shape for young women to aspire to.

Young women who are aware of media figures may *identify* with the glamour of female celebrities and fashion models, who overwhelmingly conform to this 'thin ideal'. This might motivate them to behave in ways that help them to lose weight and achieve thinness, such as dieting and exercising. This behaviour would be *vicariously reinforced* by the rewarding fame, success, wealth, respect, and satisfaction they observe in female role models in the media.

Research on SLT and AN

Helga Dittmar *et al.* (2006) studied the influence of a common model of the thin ideal – Barbie. If Barbie was scaled up to adult human size, her waist would be 39% smaller than most women with AN. Estimates suggest that 42% of UK women owned a Barbie when they were children.

Procedure 162 British girls aged five to eight years were divided into three groups. All were exposed to images (in a storybook) of either Barbie dolls, Emme dolls (more realistic dolls with a bigger body shape), or control images of flowers, balloons, and clothes. The girls were asked to rate statements about body esteem such as 'I'm pretty happy with the way I look'. The extent of their body shape dissatisfaction was also assessed by them colouring in two body silhouettes: one they thought represented their body shape, and another representing what they wanted to be.

Findings The girls who saw the Barbie images were **significantly** more dissatisfied with their body shape and had significantly lower body esteem than the girls who saw the Emme or control images. The researchers concluded that the Barbie doll is a powerful 'aspirational role model' for young girls. Girls identify with Barbie because of the glamour associated with her body shape. They internalise the thin ideal that Barbie's ultrathin proportions represent. This initiates the body dissatisfaction that may ultimately lead to eating disorders such as AN.

Evaluation

Research support

One strength of SLT is support from a **natural experiment** on the Pacific island of Fiji.

Anne Becker *et al.* (2002) investigated the effects of the introduction of TV broadcasts on eating attitudes and behaviours. A sample of 63 adolescent females completed a **questionnaire** (the EAT-26) in 1995 when TV broadcasts first began in Fiji. Another sample of 65 girls completed the same questionnaire three years later. In 1995, 13% of the girls gained a high score on the questionnaire (indicating an eating disorder risk). The corresponding figure in 1998 was 29%. The girls may have been influenced by ideals of female body shape (e.g. celebrities) transmitted through the media.

This shows that eating disorders can be the outcome of social learning processes.

Counterpoint However, Becker *et al.*'s study used two different samples of girls in 1995 and 1998. The main problem with this is that the girls in the 1998 sample were not tested before the introduction of TV broadcasts. It is therefore impossible to know whether or not they had disordered attitudes towards eating before TV broadcasts were introduced. So their scores in 1998 are meaningless because there is no way to make a valid comparison.

This serious methodological limitation undermines the researchers' claim that media influences were involved in AN-related changes.

SLT explains cultural changes

Another strength is that SLT can explain cultural changes in the incidence of AN.

AN is less common in some cultures than in others, but this situation is changing rapidly. For example, Naomi Chisuwa and Jennifer O'Dea (2010) highlight the increased rates of AN in Japan over the past 40 years. The researchers suggest that traditional values favouring plumpness as a sign of health have been displaced by the cultural thinness ideal prevalent in individualist cultures (e.g. the US). The role of the media is illustrated by the fact that there is a greater occurrence of AN symptoms in young Japanese women who regularly read magazines promoting the thinness ideal compared with those who do not.

This shows that AN may be driven by processes such as modelling media representations of the ideal female body shape.

No effective therapies

One limitation of SLT is that it has not led to effective therapies for AN.

At best, presenting models of healthy eating or body shape to someone with AN could be a useful accompaniment to a different therapy. But this is not enough on its own to be successful. As a result, SLT-derived therapies are uncommon and rarely used. This is in clear contrast to the usefulness of other explanations which are closely associated with therapies. For example, neural explanations are associated with drug therapies which are often used for extreme cases of AN, and cognitive theories (next spread) lead to cognitive behaviour therapies.

Therefore the practical value of SLT in helping people with AN is very limited.

Evaluation eXtra

Validity

SLT explains AN in terms of media and peer influences. The theory is particularly applicable to young women who are active users and consumers of social media, magazines, etc. and who also experience the greatest incidence of AN.

However, if social learning influences are responsible for AN, we would expect to see many more cases. Therefore another factor must be involved, perhaps an underlying biological or environmental vulnerability (diathesis) to develop AN.

Consider: *Is SLT really a valid explanation of AN in women?*

Apply it Concepts

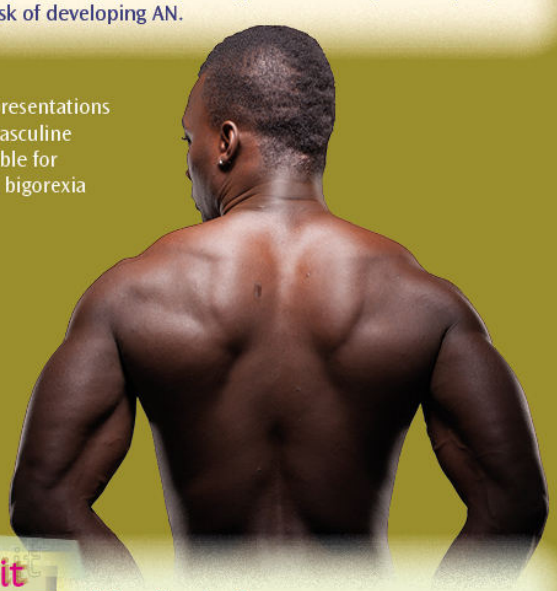
Celebrity worship

Elysia is a 17-year-old woman who takes a very close interest in what celebrities get up to. She loves reading all the magazines she can get hold of, with headlines like: *Lisa struggles to control her curves! Get your bikini body now! Drop one size! Look great naked!* Elysia thinks she is too fat, although all her friends and family disagree. She's recently started visiting pro-anorexia and 'thinspiration' websites, looking for tips.

Question

Use both biological and psychological approaches to explain why Elysia might be at risk of developing AN.

Are media representations of the ideal masculine body responsible for an increase in bigorexia in men?



Apply it Methods

Media influences

A clinical psychologist wanted to investigate how the media might influence the acquisition of eating disorders. He carried out face-to-face interviews with 20 women between the ages of 16 and 20 years, all of them diagnosed with AN. He asked various questions about their use of media such as television and the internet, and their attitudes towards weight loss and other eating-disorder-related behaviours.

Questions

1. The study produced a lot of **quantitative data**. Explain what is meant by this term. (*2 marks*)
2. Write a question that could gather quantitative data in this study. (*2 marks*)
3. Explain *two* differences between a **structured** and an **unstructured interview**. (*2 marks + 2 marks*)
4. Explain *one* way in which **investigator effects** might have influenced the outcome of this study. (*2 marks*)
5. What is meant by the term **reliability**? Explain *one* way in which reliability could have been an issue in this study. (*1 mark + 2 marks*)

Check it

1. In relation to social learning theory of anorexia nervosa, explain what is meant by 'modelling' **and** 'reinforcement'. *[2 marks + 2 marks]*
2. Outline the social learning theory of anorexia nervosa. *[6 marks]*
3. Explain how media influences may affect anorexia nervosa. *[4 marks]*
4. Describe **and** evaluate the social learning theory of anorexia nervosa. *[16 marks]*

Psychological explanations for anorexia nervosa: Cognitive theory

The specification says...

> Psychological explanations for anorexia nervosa: cognitive theory, including distortions and irrational beliefs.

In Year 1 you studied cognitive theories of depression (Beck and Ellis). Such theories point to maladaptive and faulty thought processes as the origin of mental disorders including anorexia nervosa (AN). According to cognitive theory, people with AN filter their experiences of life and their perceptions of the future through their flawed and irrational beliefs about body size.

Key terms

Cognitive distortions Faulty, biased and irrational ways of thinking that mean we perceive ourselves, other people and the world inaccurately and usually negatively.

Irrational beliefs Also called dysfunctional thoughts. In Ellis's model and therapy, these are defined as thoughts that are likely to interfere with a person's happiness. Such dysfunctional thoughts lead to mental disorders such as depression and anorexia.

Apply it Concepts

The mirror never lies – or does it?

For as long as he can remember, Khalil has always hated his body. He keeps saying that he is fat, even though everybody else disagrees. He can tell they're just being polite. Whenever he looks in the mirror, which is a lot of the time, he can spot areas of excess fat. He thinks he is overweight and out of control of his own body.

Questions

1. What aspects of this scenario suggest that Khalil might be experiencing cognitive distortions?
2. How might they cause him to develop AN?



A distorted body image is a common feature of AN. But does it contribute to *causing* the illness, as cognitive theory suggests?

Cognitive distortions

According to the **cognitive** approach, the core psychopathology of **anorexia nervosa** (AN) is **cognitive distortions** about body shape and weight. Indeed, such distortions are central to a diagnosis of AN according to the DSM-5. People with AN are described as filtering their life experiences through the three main cognitive factors identified below.

Factor 1 – Disturbed perceptions

Rebecca Murphy *et al.* (2010) argue that all other clinical features of AN stem from disturbed perceptions, including preoccupations with thoughts of food, weight, body shape (e.g. constantly looking in the mirror). People with AN become more and more critical of their own bodies. They misinterpret their emotional states as 'feeling fat', even as they get thinner and thinner.

Several research studies demonstrate that people with AN consistently overestimate their body size and weight. Different techniques are used to measure this, such as choosing from silhouettes of increasing size to match one's own body shape. Don Williamson *et al.* (1993) carried out a study using this technique. 37 participants diagnosed with AN used the *Body image assessment* to estimate their current body size and indicate their ideal size. These participants with AN were **significantly** less accurate in their size estimates than a **control group** of people with no eating disorders. The AN group also showed a marked tendency to overestimate their size and their ideal body shape was also significantly thinner than it was for the controls.

Factor 2 – Irrational beliefs

Researchers have noted that people with AN often express **irrational beliefs** and attitudes about their disorder that defy logic and rational sense. In Aaron Beck's terms, these irrational beliefs become second nature and give rise to *automatic negative thoughts*. One example is *all-or-nothing thinking*: 'If I'm not thin, I'm fat', 'If I don't control my weight, I'm worthless'. Another is *catastrophising*, putting the worst possible gloss on even the least important events: 'I ate half a biscuit today, I've got no willpower at all'.

A key irrational belief in AN is *perfectionism*, the view that the individual has to meet their most demanding standards all the time, and failure to do so is judged severely. This applies to all areas of the AN person's life – academic success, relationships, career aims – but especially to eating, body shape and striving for weight loss. Perfectionism is usually accompanied by intensive record-keeping, to make sure the individual is achieving their harsh goals. It makes some features of AN worse and more resistant to treatment, such as checking behaviours, excessive exercise and food restraint.

Paul Hewitt *et al.* (2003) claim that perfectionism is not satisfied when goals are achieved. In fact, as people with AN reach their exacting targets, they merely raise their standards still higher. So they are forever pursuing an unrealistic goal they can never attain, trapped in a vicious cycle of irrational perfectionism and starvation.

Factor 3 – Cognitive inflexibility

Recent research has focused on the possibility that people with AN lack cognitive flexibility. Janet Treasure and Ulrike Schmidt (2013) have proposed a *cognitive interpersonal maintenance model* of AN which, among other things, suggests that people with AN experience problems with *set-shifting*. That is, they find it difficult to switch fluently from one task to another task that requires a different set of cognitive skills. Instead, they tend to apply persistently the same skills in a changed situation.

This research indicates that inflexibility may be an important cognitive factor that leads to the development of AN. Once a vulnerable individual gets started on the weight loss process, they rigidly persist with it and continue to perceive themselves as needing to lose weight. They find it hard to switch to a more healthy way of thinking about their body shape and size. In effect, their weight loss is a solution to a problem that no longer exists, but they are unable to perceive this.

Study tip

You can evaluate one theory by comparing it with another, using their similarities and differences. The SLT and cognitive explanations of AN give you an ideal opportunity to do this. Make sure you don't just list the similarities and differences of the explanations for AN though. Use them to bring out the strengths and limitations of each other.

Evaluation

Research support for disturbed perceptions

One strength of cognitive theory is evidence supporting the role of disturbed perceptions in AN.

Perminder Sachdev *et al.* (2008) scanned the brains of participants with AN and also scanned healthy controls. During this process, the participants saw images of their own and other people's bodies. The same brain areas were activated in both groups when they were shown non-self images. However, when shown images of themselves the participants with AN showed very little activation in parts of the brain thought to be involved in attention. This was not true for the controls. This lack of attention is a form of cognitive distortion because they are not reacting normally.

This intriguing finding suggests that disturbed perceptions exist in AN because people with AN did not attend to their own body images.

Research support for perfectionism

Another strength of cognitive theory is support for the role of perfectionism.

Katherine Halmi *et al.* (2012) studied 728 women over the age of 16 years, all diagnosed with AN. Current AN symptoms were assessed by a questionnaire called the *Structured inventory for anorexic and bulimic eating syndromes* (SIAB). Each participant also completed the EATATE *Lifetime diagnostic interview*. This measures indicators of perfectionism in childhood, which the participants had to recall. The researchers found that childhood perfectionism (e.g. schoolwork perfectionism) was associated with current AN symptoms.

This suggests perfectionism precedes onset of AN, confirming it as a potential risk factor for development of the disorder.

Counterpoint However, there is a serious limitation to the Halmi *et al.* study because the method of assessing childhood perfectionism was retrospective. Participants had to think back to their childhoods and recall incidents of perfectionism. Such recall is likely to be distorted. For example, it could be that participants who are currently most perfectionist as adults are more likely to remember being perfectionist as children.

This suggests that the link between childhood perfectionism and development of AN may be artificially inflated.

Contradictory research

One limitation is that some research challenges the cognitive theory of AN.

Piers Cornelissen *et al.* (2013) compared the body images of 30 women with AN and 137 women without AN. The researchers used a morphing task – the participants had to adjust a computerised image of themselves until it matched their estimated body size. The software was then able to calculate the body mass index (BMI) of the manipulated image. The researchers found no significant differences between the groups of women in the correlations between estimated and actual BMIs.

This suggests that people with AN do not have a distorted body image, and challenges the central role of body image perception in cognitive theories of AN.

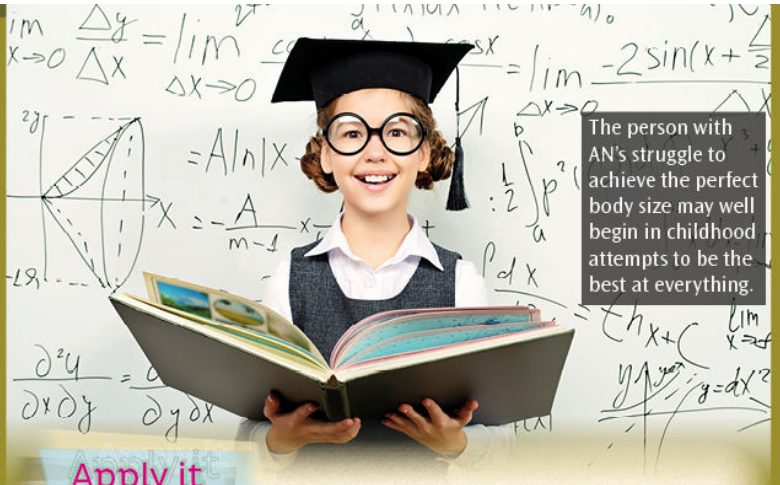
Evaluation eXtra

Issues of causation

Research covered on this spread shows that several cognitive factors are key features of AN. Cognitive theory goes further and argues that these are causal in the development of AN. This is a very strong claim, especially given other alternative causal theories (e.g. genes).

However, it is just as likely that cognitive factors are consequences (effects) of AN rather than causes. The research we have studied supports this view. For example, Murphy *et al.* (facing page) studied preoccupations with body shape which may be an effect of AN.

Consider: *Do cognitive factors cause AN or are they effects?*



The person with AN's struggle to achieve the perfect body size may well begin in childhood attempts to be the best at everything.

Apply it Concepts — Simply the best

When she was a child, Caitlyn wanted to be the best at everything. She was so competitive about schoolwork, sport, her appearance, everything. None of what she achieved was ever good enough for her. She's the same now, except she wants to be the best at losing weight and being thin. Caitlyn knows exactly what other people are thinking when they talk to her. She knows for certain that she'll never be accepted or liked until she is as thin as she can be.

Questions

1. What is Caitlyn's central irrational belief?
2. Describe *two* others she might hold.

Apply it Methods — A body image experiment

A psychologist wanted to investigate body image distortions in AN. She recruited 20 females with AN and 20 without AN by using an opportunity sampling method. All of the participants had to adjust a digital image of their body size until it matched their own estimation. The results are shown in Table 1.

Table 1 Number of participants with and without AN overestimating and underestimating their body size.

	Overestimated	Underestimated
With AN	14	6
Without AN	9	11

Questions

1. Explain why the research method used in this study is a **quasi-experiment**. (*2 marks*)
2. Explain *one* strength and *one* limitation of this research method in this study. (*3 marks + 3 marks*)
3. Name a suitable **statistical test** to analyse the data in Table 1 and justify your choice. (*3 marks*)
4. The psychologist decided to extend her research by conducting a **meta-analysis**. Explain what is meant by this term. (*2 marks*)

Check it

1. In relation to cognitive theory of anorexia nervosa, explain what is meant by 'distortions' and 'irrational beliefs'. *[2 marks + 2 marks]*
2. Outline research into the cognitive theory of anorexia nervosa. *[6 marks]*
3. Explain **two** criticisms of the cognitive theory of anorexia nervosa. *[3 marks + 3 marks]*
4. Discuss the cognitive theory of anorexia nervosa. *[16 marks]*

Biological explanations for obesity

The specification says...

Biological explanations for obesity, including genetic and neural explanations.

Obesity is usually defined in terms of body mass index (BMI). This is a common way of classifying people as underweight, normal weight, overweight or obese, and takes into account height. Someone with a BMI of 30 or above is considered obese.

More and more people are dying prematurely or experiencing disability due to the often undiagnosed effects of obesity. This is why psychologists believe it is essential that we understand the causes of obesity. We start our investigation of obesity with the biological approach, looking at genetic and neural explanations.

Key terms

Obesity Having too much body fat, often defined as a BMI (weight divided by the square of the person's height) of more than 30.

Genetic explanation Genes consist of DNA strands. DNA produces 'instructions' for general physical features of an organism (such as eye colour, height) and also specific physical features (such as neurotransmitter levels and size of brain structures). These may impact on psychological features (such as intelligence and mental disorder). Genes are transmitted from parents to offspring, i.e. inherited.

Neural explanation Any explanation of behaviour (and its disorders) in terms of (dys)functions of the brain and nervous system. This includes the activity of brain structures such as the hypothalamus, and neurotransmitters such as serotonin and dopamine.



The usual rewarding cues associated with eating (such as smells) may be less prevalent in obese people because of dopamine dysfunction.

Genetic explanation for obesity

Obesity runs in families

The genetic explanation often looks to family studies for evidence. There are clear family-related patterns to obesity, measured in terms of body mass index (BMI). Caution is obviously needed in interpreting findings because of the difficulty of separating shared genetic and environmental influences in any relatives who live together. Even so, **concordance rates** for first-degree relatives are in the region of 20% to 50%, which indicates a moderate degree of heritability (Chaput *et al.* 2014).

Twin studies have generally suggested a greater **genetic** component. Cassandra Nan *et al.* (2012) conducted a **meta-analysis** of 12 twin studies involving over 8000 **MZ** and nearly 10,000 **DZ twins**. Concordance rates ranged from 61% to 80%, which demonstrates a very substantial genetic component to obesity that remained influential from late childhood through adolescence to adulthood.

Polygenic determination

Adam Locke *et al.* (2015) studied the **genomes** of more than 300,000 people, and identified 97 genes associated with variations in BMI. This finding very clearly demonstrates that the action of genes on obesity is **polygenic**. That is, genetic inheritance involves multiple genes, their effects interacting with each other. This is made even more complex when you consider there are other ways of measuring obesity (such as waist-to-hip ratio, which focuses on amount of abdominal fat). Different genes may influence different aspects of obesity.

So there is no single genetic cause of obesity. Many genes are involved, all with relatively small effects. Locke *et al.* reported that their 97 genes accounted for only 2.7% of BMI variation, a small fraction of the **heritability** of obesity. Some researchers suspect that the true figure necessary to explain this 'missing heritability' may be as many as 400 genes (Watson 2009).

Neural explanation for obesity

The neural explanation focuses on **neurotransmitters** such as **serotonin** and **dopamine**, particularly in terms of their role in the brain's reward systems.

Serotonin

Most research studies of both humans and non-human animals show that obesity is associated with abnormally low levels of serotonin (or its main **metabolite** *5-HIAA*). Normal levels of serotonin regulate feeding behaviour by inhibiting the activity of various sites in the **hypothalamus**, including the *ventromedial hypothalamus* (see page 230). It is serotonin that signals to the hypothalamus that we have eaten to satiety.

Dysfunctions of the serotonin system can occur due to stress or **co-morbid** disorders such as **depression**. They may even be genetically inherited. In such cases, levels of serotonin are abnormally low, creating inaccurate satiety signals that are sent to the hypothalamus, **disinhibiting** eating behaviour. Low serotonin levels lead to cravings for carbohydrates, energy-dense foods including sugars, causing weight gain through too many calories.

Dopamine

Dopamine has a crucial role in the brain's reward and motivation systems. Normal levels of the neurotransmitter stimulate brain areas such as the hypothalamus, **hippocampus** and **amygdala**, providing rewarding feelings of pleasure and well-being. Dopamine activity is associated with the pleasure we derive from eating and cues associated with eating (such as the smell of food). However, obesity has been linked with a dysfunctional dopamine system in many research studies. Gene-Jack Wang *et al.* (2001) found that obese individuals had **significantly** fewer dopamine D2 receptors than normal-weight controls, in a part of the brain called the *striatum*.

Because levels of dopamine are so low in some people, the neurotransmitter cannot perform its usual pleasurable reward function in response to eating, i.e. a person does not feel good after eating. Overeating can therefore be seen as an attempt to activate reward centres in the brain that provide feelings of pleasure, by increasing dopamine levels. This explanation suggests that obesity is the outcome of a food **addiction** that operates neurochemically in ways similar to other addictions.

Apply it

Concepts It's in the genes

Dev is a young boy who is quite overweight. He has noticed recently that his mum and dad and most of his family are overweight as well. Dev wonders if obesity might run in families.

Question

Even if obesity runs in Dev's family, does this mean that his weight is only the result of genes? Explain your answer.

Evaluation

Plausible biological mechanism

One strength is that researchers can explain how genes affect obesity.

Twin studies establish that obesity is heritable but don't explain the mechanism by which this happens. According to Stephen O'Rahilly and Sadaf Farooqi (2008), genetic influences may affect our responses to the environment, for instance by making some people more sensitive to visual food-related cues. Genes may also influence the activity of neurotransmitter systems that are linked with obesity (see below).

This explanation increases the validity of the genetic explanation.

Unexpected findings

One limitation is there is evidence challenging the roles of the most obvious genes.

Valentina Paracchini *et al.* (2005) carried out a **meta-analysis** of 25 studies that investigated genes thought to be involved in regulating leptin (the *LEP* gene) and leptin receptors (the *LEPR* gene). There was no evidence of a link between these genes and obesity. This was a surprising finding as leptin is an obvious target for research into genetic effects because its activity is known to be central to weight regulation (see page 230).

This raises doubts about the validity of the genetic explanation.

Evaluation eXtra

Diathesis-stress

We know that genes make a significant contribution to obesity, but they do not determine it – they create a diathesis. An individual does not inherit obesity *per se*.

However, environmental factors are also important because they 'trigger' the diathesis. Such factors include stressors (e.g. bereavement, exams). Some people overeat to cope with feelings of anxiety or depression that arise from such stressors. Many stressors can be controlled to reduce the likelihood of obesity.

Consider: *Do genes or environment make the more important contribution to AN?*

Evaluation

Evidence for serotonin

One strength of the neural explanation is evidence for the role of serotonin in obesity.

Sunny Ohia *et al.* (2013) highlight the importance in obesity of one serotonin receptor in particular, the 2C receptor. They reviewed studies of 'knockout' mice. These animals are genetically engineered to have no functioning 2C receptors because the gene is removed or 'knocked out'. The findings of these studies show that such mice develop late-onset obesity.

This research supports a link between obesity and a dysfunctional serotonin system.

Evidence for dopamine

Another strength is evidence for the role of dopamine in obesity.

Research attention has focused on the *DRD2* gene, which codes for the D2 receptor implicated in obesity. Margaret Spitz *et al.* (2000) compared the genomes of obese and non-obese participants. They found that one version of the DRD2 gene (the B1 allele) was twice as prevalent in the obese participants. One explanation is that people with low dopamine levels (due to inheriting fewer D2 receptors) experience less dopamine-activated pleasurable reward from eating which makes them more likely to overeat because they are seeking satisfaction.

This finding supports both neural and genetic explanations – because there may be a genetic basis to dysfunctions of the dopamine reward system in obesity.

Evaluation eXtra

Drug treatments

Neural explanations lead to drug treatments for obesity. The aim is to increase levels of serotonin and dopamine, thereby altering satiety signals and helping to prevent disinhibited eating. Understanding of neural activity could lead to better drug treatments.

However obesity is a chronic disorder that requires an appropriate treatment. Anti-obesity drugs have side effects which mean they can only be used for short periods. This is why the standard treatment is to make lifestyle changes.

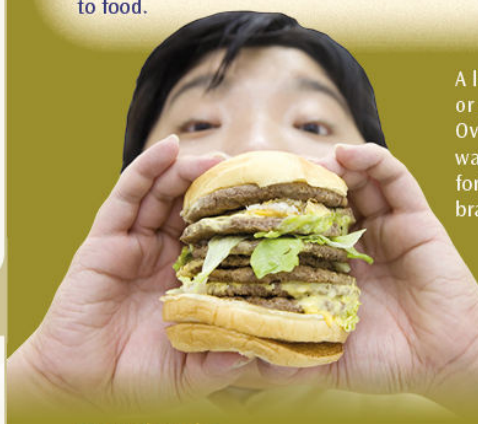
Consider: *Is continuing research into drug treatments for obesity justified?*

Apply it Concepts — A food addiction?

Hadley has tried all sorts of diets to lose weight but none of them have worked. She knows it's not just a matter of willpower because she really has tried hard. She sometimes thinks she must be addicted to food like some people are addicted to cigarettes or alcohol.

Question

Explain what might have gone wrong with Hadley's serotonin and dopamine systems to account for her apparent addiction to food.



A lack of willpower, or something else? Overeating may be a way of compensating for deficiencies in the brain's reward systems.

Study tip

Obesity is one of those topics in which anecdotal evidence is very common. People's personal opinions are important, but they're no substitute for scientific and research evidence. Make sure your answers contain clear *psychological* content rather than views you can hear from just about anyone.

Apply it Methods — Obesity and serotonin

A psychologist wanted to investigate the link between neurotransmitters and obesity. He recruited a volunteer sample of 20 obese people and 20 lean people. He defined obesity as a body mass index (BMI) of above 30 and lean as a BMI below 19. The psychologist took blood from the participants and measured the levels of serotonin in the blood plasma.

Questions

1. Explain how the **dependent variable** has been **operationalised**. (*2 marks*)
2. Identify and explain the type of **experimental design** used in this study. (*1 mark*)
3. Explain *one* strength and *one* limitation of this design in this study. (*2 marks + 2 marks*)
4. Write a **non-directional hypothesis** for this study. (*2 marks*)
5. Explain *one* potential **confounding variable** that could arise in this study. (*2 marks*)

Check it

1. Outline what research has found concerning the role of genetics in obesity. *[6 marks]*
2. Outline the neural explanation for obesity. *[6 marks]*
3. Evaluate research (theories and/or studies) into the genetic explanation for obesity. *[8 marks]*
4. Describe **and** evaluate **one or more** biological explanations for obesity. *[16 marks]*

Psychological explanations for obesity

The specification says...

Psychological explanations for obesity, including restraint theory, disinhibition and the boundary model.

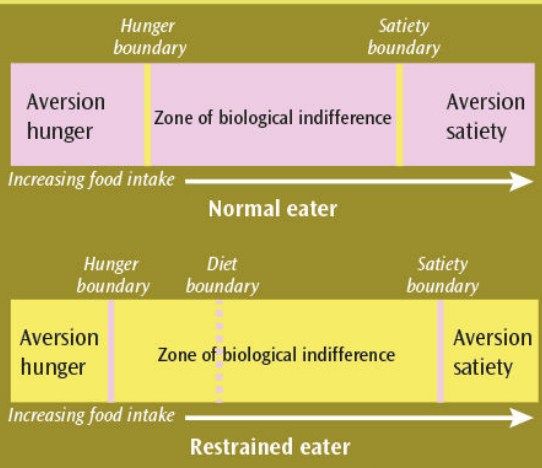
Research by Ancel Keys and his colleagues (1950) conducted during the Second World War suggested a strange possibility. They subjected Americans who did not want to fight (conscientious objectors) to starvation diets. The men found themselves thinking more about food the more they were denied it. So, is limiting the amount you eat a risk factor for obesity? In this spread, we look at a psychological explanation that suggests exactly that.

Key terms

Restraint theory A cognitive explanation which argues that obesity is the paradoxical outcome of attempts to restrain eating (i.e. dieting).

Disinhibition A lack of restraint (no longer being inhibited). May be due to environmental triggers or overexposure to a stimulus, resulting in socially unacceptable behaviours becoming acceptable and therefore more likely.

Boundary model Explains how restrained eaters are less sensitive to satiety so need more food before feeling full. When they break their self-imposed diet boundary they continue to eat to the satiety boundary, making weight gain more likely.



Herman and Polivy's boundary model – restrained eaters do not eat according to their biological needs, as normal eaters do.

Apply it

Concepts

Felix gains weight

It all started when Felix lost his job. He noticed that he was getting a bit fatter, so he took action. He decided to cut down on the carbs and eat a bit less. But when Felix next went on the scales, he was astonished to find that he had actually put even more weight on! His BMI is now 26 and it appears he is in danger of becoming officially obese.

Question

How would you use your knowledge of restraint, disinhibition and the boundary model to explain to Felix why he might become obese?

Restraint, disinhibition and the boundary model

Restraint theory

Peter Herman and Janet Polivy (1975) developed a **cognitive** theory of obesity – **restraint theory**. Attempting to lose weight typically involves restrained eating i.e. deliberately limiting food intake. Herman and Polivy argued that restrained eating is self-defeating. The vast majority of people who restrain their eating fail to lose any weight. A **significant** proportion even overeat to the extent that they become obese.

Cognitive control Restrained eaters set strict limits on their food intake. They categorise foods into 'good' and 'bad', and create rules about which are allowed and forbidden, as well as the amounts they believe are consistent with weight loss. A restrained diet is a highly organised way of imposing the control which restrained eaters believe is the way to lose weight. This control is cognitive because the individual has to consciously think about their weight and eating a lot of the time.

Paradoxical outcome However, the result is that the restrained eater becomes *more* preoccupied with food rather than less. By placing limits on what and how much they eat, the restrained eater no longer eats when they are hungry and stops when they are full. Their eating behaviour is no longer under physiological control. In fact, they actively ignore physiological indicators that signal hunger and satiety, and this leads to disinhibition of eating behaviour.

Disinhibition

Obesity is not caused by restrained eating alone. It is the result of a dysfunctional cycle of restraint and **disinhibition**. A period of restrained eating is often followed by disinhibited eating in which the individual eats as much as they want. Restrained eaters are vulnerable to internal and external food-related cues such as mood (internal) and smells or **media** images (external). These cues are called *disinhibitors* and lead to a loss of control over restrained eating (even a binge).

The cognitive process that governs disinhibition is a form of distorted thinking such as *all-or-nothing thinking*. Once the restrained eater has been disinhibited by, for instance, a stressful day combined with the sight and smell of their favourite forbidden food, they continue to eat because there's no point in stopping, 'Well I blew it. I might as well eat all of this because I won't be able to tomorrow'.

The boundary model

Herman and Polivy (1984) sought to explain the impact of restrained eating and disinhibition in their **boundary model** of obesity (see diagram, left). Food intake exists on a continuum from hungry to satiated (feeling full). Biological processes are the key determinants of how much we eat at each end of this continuum. So when our energy levels dip below a 'set point' we feel an aversive state of hunger and are motivated to eat. Eating to fullness creates an aversive state of discomfort and we are motivated to stop eating. In terms of the model, eating begins at the hunger boundary and stops at the satiety boundary. Between these two points is the zone of biological indifference (ZBI) where biological processes have minimal effect. Instead, cognitive and social factors have their greatest influence on food intake, when we are neither particularly hungry nor full.

Restrained eaters (described above) People who are restraining their eating have a lower hunger boundary so are less responsive to feelings of hunger. They also have a higher satiety boundary, so they need more food before they feel full. Their zone of biological indifference is therefore wider, which means more of their eating behaviour comes under cognitive rather than physiological control. This makes them vulnerable to the effects of disinhibition outlined above.

Restrained eaters have a self-imposed upper boundary, which represents the most they want to eat, e.g. 'two squares of this chocolate bar is the maximum'. This is some distance below the satiety boundary set by biological processes. When restrained eaters break the diet boundary, they carry on eating beyond the satiety boundary. This is an example of disinhibition which Herman and Polivy call the 'what the hell effect', marked by passivity and resignation: 'I might as well eat the lot'.

Evaluation

Research support

One strength is research to support the roles of restraint and disinhibition.

Jane Wardle and Sally Beales (1988) **randomly allocated** 27 obese women to three groups. One group followed a restrained-eating diet for seven weeks. Another group followed an exercise regime but did not restrain their eating. The third group received no treatment of any kind. The restrained eaters consumed significantly more calories than the other participants because, even though they tended to eat less throughout the seven-week period, they occasionally experienced disinhibition when they would eat beyond feeling full.

This suggests that restraint leading to disinhibition is a causal factor in overeating, which inevitably leads to weight gain and obesity.

Counterpoint However, the outcome of the above study was relatively short-term. Jennifer Savage *et al.* (2009) carried out one of the few long-term **prospective** studies into restrained eating. They measured dietary restraint and disinhibition in 163 women at the start of the study and every two years afterwards over a six-year period. They found that increases in restrained eating were linked to decreases in weight (it was a significant negative correlation).

This suggests that restrained eating while dieting leads to weight loss rather than weight gain in the long term, the opposite outcome to that predicted by restraint theory.

Food-related cues

Another strength is support for the role of food-related cues in disinhibition.

The disinhibition model claims that restrained eaters are vulnerable to food-related cues, such as those from the media. Jessica Boyce and Roeline Kuijer (2014) supported this in a study that showed participants images of thinness (models advertising beauty products). Other participants saw neutral images (e.g. furniture). The participants' food intake was then measured in a ten-minute 'taste test'. They were allowed to eat as much as they liked from four bowls of snack foods such as biscuits. Restrained eaters (people who were dieting) ate significantly more than unrestrained eaters after being shown media images of thinness. There was no such difference in response to the neutral images.

This shows that food-related cues act as disinhibitors which may trigger overeating and obesity in restrained eaters.

Restraint is complex

One limitation is that restraint is more complex than the boundary model indicates.

Researchers have identified at least two different forms of restraint. One is *rigid restraint*, which is an all-or-nothing approach to limiting food intake. The other is *flexible restraint*, which allows a restrained eater to eat limited amounts of some 'forbidden' foods without necessarily triggering disinhibition. Only rigid restraint is likely to lead to obesity. This could explain why some research (e.g. Savage *et al.*) has found that restrained eating can produce weight loss.

Therefore the boundary model is a limited explanation of obesity because it fails to consider the true complexity of restraint.

Evaluation eXtra

Research methods

Many studies of the boundary model are lab experiments. They measure the food intake of restrained (dieting) and unrestrained (non-dieting) individuals while controlling confounding variables. Lab experiments can therefore establish that restraint is a *cause* of overeating and obesity.

However, lab studies are highly controlled, so are unlike real-world food-related environments. Lab studies also feature demand characteristics, which operate so participants behave how they believe the researchers want them to.

Consider: *How useful are lab experiments for studying obesity?*

Apply it Concepts — Gav and Shona

Gav has tried eating less at times, but is still several kilos overweight. He finds himself thinking about food quite a lot. If he starts eating something he shouldn't, like some chocolate, he'll often eat the whole lot. Shona doesn't really give much thought to food. She just eats when she feels hungry. Her weight is normal and has hardly fluctuated over the years.

Question

Explain which parts of this scenario illustrate: (a) restrained eating, (b) physiological control, (c) cognitive control, (d) diet boundary, (e) disinhibition.



'I might as well eat it all.' A common experience of disinhibition for the restrained eater.

Apply it Methods — Snack attack!

A psychologist wanted to study restrained eaters, people who limit their food intake because they want to lose a few kilos. Because restrained eaters are poor at estimating how much they have eaten, the psychologist decided to carry out an observational study. She recruited 15 restrained eaters and installed cameras in their houses to record their eating behaviour over a one-week period. The footage was then analysed by a research assistant who counted various behaviours.

Questions

1. Outline *one* **sampling method** the psychologist could have used to recruit the participants. (*2 marks*)
2. Explain *one* limitation of this method. (*2 marks*)
3. Explain why the camera footage was analysed by a research assistant rather than by the psychologist. (*2 marks*)
4. Explain *two* **ethical issues** that the psychologist should have taken into account in this study. (*2 marks + 2 marks*)
5. Name *two* **behavioural categories** that might have been used to count behaviours. (*2 marks*)

Check it

1. In relation to psychological explanations of obesity, explain what is meant by 'restraint theory' **and** 'disinhibition'. *[2 marks + 2 marks]*
2. Outline the boundary model of obesity. *[6 marks]*
3. Outline the disinhibition model of obesity. *[3 marks]*
4. Describe **and** evaluate psychological explanations for obesity. *[16 marks]*

Explanations for the success and failure of dieting

The specification says...

Explanations for the success and failure of dieting.

'Preach not to others what they should eat, but eat as becomes you and be silent.'

(Epictetus, Greek philosopher)

Epictetus's guidance amounts to: 'Eat when you're hungry, don't eat when you're not. And don't go on about it.' If people who want to lose weight followed his advice, that would be the end of the multi-billion-pound dieting industry.

It has been estimated that up to 50% of the adult population take active steps to control or lose weight within a one-year period, with women significantly more likely than men to do so (Laska *et al.* 2011).

Key term

Dieting A conscious attempt to lose weight, usually by restricting how much is eaten. A number of biological and psychological factors (e.g. genetic, neural, cognitive) potentially influence the success or failure of dieting attempts.

Apply it Concepts

A variety of faddy diets

Shazia has been on many diets over the years to try and lose weight – the Atkins, Cambridge, Slim-Fast, South Beach, New Atkins . . . she's tried them all. Now she's heard about a new one called the 5:2, so she's thinking of giving that a go. The trouble is, they always start really well. Shazia loses lots of weight in the first couple of weeks, but then it gets harder and harder until it just doesn't seem to work anymore. It doesn't take long before all the weight goes back on again. But she's optimistic that this new diet will be different.

Question

How can the explanations on this spread account for Shazia's 'yo-yo' dieting?



That's not going to work. Just the very act of fighting against the fattening food means that you're thinking about the fattening food. How ironic is that?

Explanations for the success and failure of dieting

The spiral model

Todd Heatherton and Janet Polivy (1992) proposed that **dieting** behaviour is a chain of linked events. Dieting often begins in adolescence when individuals (overwhelmingly women) experience body dissatisfaction. Initially, first-time dieters experience some success because they temporarily lose weight. But lasting weight loss is rare, so ultimately weight is regained and the diet fails. Some give up altogether, but most attribute the failure to some personal deficiency, for example they didn't try hard enough or they lacked willpower.

Most dieters do not rethink but instead 'stick to the plan', only next time they eat even less. This ever-greater restriction of food intake has physical and psychological effects. The dieter experiences more frustration and emotional distress, which makes them vulnerable to **disinhibited** eating (i.e. eating with no inhibition/restraint).

At the same time, metabolic processes in the body change so that weight loss becomes physically more difficult to achieve. For instance, **ghrelin** levels increase (stimulates appetite) and **leptin** levels decrease (again this increases appetite) after **significant** weight loss. The result is further failure followed by repeated attempts to 'diet harder', and a lowering of **self-esteem** and increase in **depression** over time. The individual is now trapped in a destructive 'downward spiral' in which weight loss is less and less likely.

Ironic processes theory

We saw in the last spread that when people deliberately restrict their food intake they become preoccupied with thoughts of food. Daniel Wegner (1994) explained this in his *theory of ironic processes*. It stems from a study where he asked people not to think about a white bear and found this almost guaranteed they would think about one, even more often than people specifically asked to think of one (Wegner *et al.* 1987). So the paradoxical outcome of trying to suppress a thought is to make it more likely. Certain foods become more salient (they stand out) when a dieter labels them 'forbidden'. For example, this leads to disinhibition of eating, excessive food intake and ultimately dieting failure.

There is a further irony. Attempting to distract yourself from thinking about forbidden foods (for example by reading a book) requires mental activity. This leaves you lacking the **cognitive** processing capacity to suppress the thought, which inevitably reappears. This is why 'being on a diet' can be at the same time so all-consuming and yet self-defeating.

Disinhibition and dieting

You can apply the concept of disinhibition (discussed on the previous spread) to the success and failure of dieting.

Most diets place limits on food intake. But when people restrain their eating they become vulnerable to both internal and external food-related cues (e.g. visual images, smells, etc.). The spiral model points out that continuous restraint leads to emotional frustration and distress, which the dieter tries to combat by eating. According to ironic processes theory the dieter is constantly reminded of foods they are not supposed to eat. This means they think about food more than usual.

These processes lead to disinhibition. The dieter loses control and overeats, so they lose no more weight than someone who was not dieting and may even gain some.

Practical activity on page 247

Evaluation

Real-world application

One strength of the spiral model is that it suggests how dieting can become successful.

The model identifies several points at which the individual can 'break out' of the spiral. According to Heatherton and Polivy, people who diet to lose weight often have low self-esteem. But this is not true of people who restrain their eating to *avoid putting on weight* – their self-esteem is higher (Lowe and Kleifield 1988). It is the low self-esteem that leads to disinhibited eating (loss of control), so preventing low self-esteem can help avoid diet failure.

Therefore perhaps the best way to dieting success is to promote self-esteem by ending attempts to lose weight and accepting oneself as one is.

Support for ironic processes theory

Another strength is evidence for the role of ironic processes.

Marieke Adriaanse *et al.*'s (2011) participants were students who were trying to cut down on their intake of unhealthy snacks. They were presented with diet intentions expressed in a negative form (e.g. 'When I am sad, I will not eat chocolate'). After the participants were exposed to these statements, they kept a snack diary during the following week. The researchers found an ironic rebound effect. The participants ate unhealthy snacks more often and consumed more calories than a control group.

This finding shows how just thinking of oneself as dieting can lead to the failure of the diet.

Counterpoint Studies such as Adriaanse *et al.*'s provide some evidence for the role of ironic processes in eating behaviour. But it is unclear how far they can account for the success or failure of dieting. Wegner himself accepted that the effects of ironic processes are relatively small and short-term. In many studies, including this one, the ironic rebound effect is measured in terms of just days or one or two weeks. Real-world attempts to lose weight typically extend over a much longer period of time.

This means that other factors are probably more important in determining diet success, such as self-esteem as proposed by the spiral model.

Individual differences

One limitation is that theories do not account for individual differences.

According to Jane Ogden (2010), the theories in this spread do not explain why some people succeed in losing weight even when they are preoccupied with food (including people with anorexia nervosa). One explanation is **locus of control**. For example, 'internals' believe that weight loss is contingent on their own efforts and that they have control over success or failure. 'Externals' do not believe they have control so are less likely to succeed.

Therefore, the explanations on this spread cannot offer a general prediction of who is likely to fail or succeed in losing weight.

Evaluation eXtra

Is dieting pointless?

The explanations on the facing page suggest that there is a point in dieting. The spiral model suggests that this can be achieved by improving self-esteem. According to ironic processes theory, dieters must avoid viewing some foods as 'forbidden'.

However, the evolutionary approach suggests that dieting is pointless because reduction of food intake inevitably leads to overeating. The 'drive' to eat is adaptive because it enhanced our distant ancestors' chances of survival. They overate in times of plenty to compensate for periods of famine. But we live in an environment where food is available all the time.

Consider: *So, is dieting pointless?*

Apply it Concepts — Failure into success?

Bradley is very organised and controlling about losing weight. He keeps records of his weight loss and how much exercise he's done. He has apps to help him monitor his progress, and special scales. But in reality Bradley finds it very difficult. He sometimes thinks the more he tries to put food out of his mind, the more it keeps popping back into his head. He's worried that losing weight is taking over his whole life and he can't think about anything else.

Question

Select *one* of the three explanations on the facing page and use it to suggest how you think Bradley could be more successful in his attempts to lose weight.



People who perceive themselves as 'on a diet' exercise control by detailed planning and organisation of their food intake.

Apply it Methods — Analysing dieting

A team of researchers recruited a sample of ten dieters to investigate the failure of diets. They collected data from the participants about the reasons why they failed to maintain their initial weight loss. The researchers used content analysis to identify two broad categories of reasons: internal (such as, 'I didn't have enough willpower') and external (such as, 'There was too much unhealthy food available').

Questions

1. Explain how the psychologists could have carried out their **content analysis**. (*4 marks*)
2. Outline how the researchers could have chosen a **volunteer sample** of dieters. (*2 marks*)
3. Explain *one* limitation of this sampling method. (*2 marks*)
4. What is meant by the term **reliability**? (*1 mark*)
5. Explain how the two psychologists could have established the reliability of their content analysis. (*3 marks*)

Check it

1. Outline **one** explanation for the success and failure of dieting. *[6 marks]*
2. Briefly discuss **two** limitations of explanations for the success and failure of dieting. *[6 marks]*
3. Discuss **two or more** explanations for the success and failure of dieting. *[16 marks]*

Practical corner

The specification says...

> Knowledge and understanding of... research methods, practical research skills and maths skills. These should be developed through ... ethical practical research activities.

This means you should conduct practical activities wherever possible. The two activities on this spread are both experiments. One of them provides an ideal opportunity to gain an insight into the food preferences of young children. Childhood is the time when our food likes and dislikes are most obvious. The other is a chance to look further into an influential theory of why diets usually do not work – the ironic processes theory.

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?

The maths bit

Overall, at least 10% of the marks in assessments for Psychology will require the use of mathematical skills and this is included in the requirement that at least 25–30% in total will involve research methods.

Don't avoid it!



Practical idea 1: Investigating children's taste aversions

Children famously dislike green vegetables such as broccoli and sprouts. Parents have been insisting 'eat your greens' for many generations, so it is certainly not a recent phenomenon. We saw in the first spread in this chapter how this aversion is perhaps evolutionarily adaptive. Green vegetables do harbour bitter tastes, and bitterness is closely associated with toxic compounds in foods. So it makes a lot of survival sense to avoid these until you know for sure that they are safe.

The aim of this practical activity is to find out if children really do have an aversion to green vegetables in particular.

The practical bit

The design

This practical is an **experiment**, in which you compare children's preferences for different foods. So the **independent variable** is food type. The comparison you will make is between green vegetables and other food types – these are the conditions of the IV.

The **dependent variable** is degree of liking, but you will need to give some thought to how best to measure this (see below for more advice).

Your participants

The ideal way to study children's food preferences is to ask them directly. But **ethical** guidelines for A level students are very clear – using children under 16 years of age in your research is inappropriate because they are potentially vulnerable.

The solution is to ask parents about their children's preferences instead. If both of a child's parents are available, it makes sense to select the one most responsible for what the child eats. You could even take steps to control potentially **confounding variables** such as age, by selecting only the parents of, say, seven-year-olds. Recruit as many parents as you can reasonably find, but ten would be a helpful number.

Materials and procedure

Start by putting together a list of different food items, including some green vegetables. Here's a list of examples: broccoli, sprouts, cabbage, lettuce, peas, carrots, tomatoes, mushrooms, fish, chicken, chocolate, ice cream, burgers, crisps, cake, biscuits, etc. It's reasonable to assume that most parents will be aware of the names of everyday food items. If there is any doubt about this you could provide images of each one. To prevent the task becoming boring, don't include too many items. Just a few will do.

As for measuring preferences, you have a couple of options. The most basic is to ask parents whether their child likes or dislikes each item. A more sophisticated method is to get parents to rate their child's liking on a scale, say from one (intensely dislike) to ten (really like).

Analysing your data

You will have a reasonable amount of **quantitative data** at the end of this procedure. Each parent will provide a rating of their child's liking for each food item you choose to include. To begin your analysis, divide the ratings into those for green vegetables and those for 'other foods'. You now need an average rating for each child for both food categories. Think carefully about which **measure of central tendency** is the appropriate one to use. You can then apply a **statistical test** to see if the ratings for green vegetables are **significantly** lower.

Apply it
Methods

The maths bit 1

1. In the study described above, what is the level of measurement of the dependent variable? (*1 mark*)
2. Explain why the **median** is the most suitable measure of central tendency to use to summarise the data. (*2 marks*)
3. State the appropriate statistical test to use to analyse the results and give *three* reasons why you have made this choice. (*1 mark + 3 marks*)
4. Apply the statistical test you identified in your previous answer to the data in Table 1. What is the **calculated value**? State whether or not this is significant. Explain how you came to this decision. (*1 mark + 1 mark + 3 marks*)

Table 1 Median ratings of liking for two types of food.

Parent/child	Green vegetables	Other foods
1	4	6
2	5	8
3	3	8
4	4	9
5	3	6
6	4	10
7	2	7
8	4	5
9	1	10
10	2	7

Practical idea 2: Testing ironic processes theory

Daniel Wegner and his colleagues (1987) found that instructing people not to think of a white bear was counterproductive, because most of his participants couldn't help themselves. Trying to suppress a thought meant that it was paradoxically more likely to be brought to mind. We saw in the previous spread how this helps to explain the failure of dieting.

The aim of this activity is essentially to replicate Wegner *et al.*'s study, but using a food-related thought rather than one of a white bear.

The practical bit

Following Wegner *et al.*'s procedure, you will be asking your participants to carry out two very straightforward tasks. In one, they will try to suppress thoughts about biscuits (or whatever food-related item you fancy). This is the *suppression task*. In the other task, participants think about whatever they wish, including biscuits (or whatever your target is). This is the *expression task*. All of your participants will need to do both tasks, one after the other. But half of them will carry out the suppression task first, followed by the expression task. For the other half, it's the other way round. The **independent variable** is not the tasks themselves, but the *order* in which they are performed.

Your **hypothesis** is that doing the suppression task first will lead to more thoughts of biscuits in the expression task.

Selecting participants

Opportunity sampling is the most convenient method, as usual. You could approach potential participants in communal areas of your school or college. You will then need to find a quiet room with a table and chairs, the more comfortable the better. Participants are tested individually.

Procedure and instructions

Start the procedure by encouraging the participants to relax and get comfortable. You could also reassure them that they will not be doing anything difficult, to put them at ease. You could even consider playing some soothing background music. Because it is crucial that your participants understand what they have to do, you need some clear instructions for each task. Here are some examples:

> Suppression: *All I want you to do in the next three minutes is to relax. You can close your eyes or keep them open. Please just think about whatever you want with one exception. Please try not to think about biscuits. But if you do think about biscuits, every time you do, please tap on this table.*
>
> Expression: *All I want you to do in the next three minutes is to relax. You can close your eyes or keep them open. Please just think about whatever you want, including biscuits. Every time you think about biscuits, please tap on this table.*

Remember that for half of your participants, you will give the suppression instructions first. For the other half, the expression instructions come first.

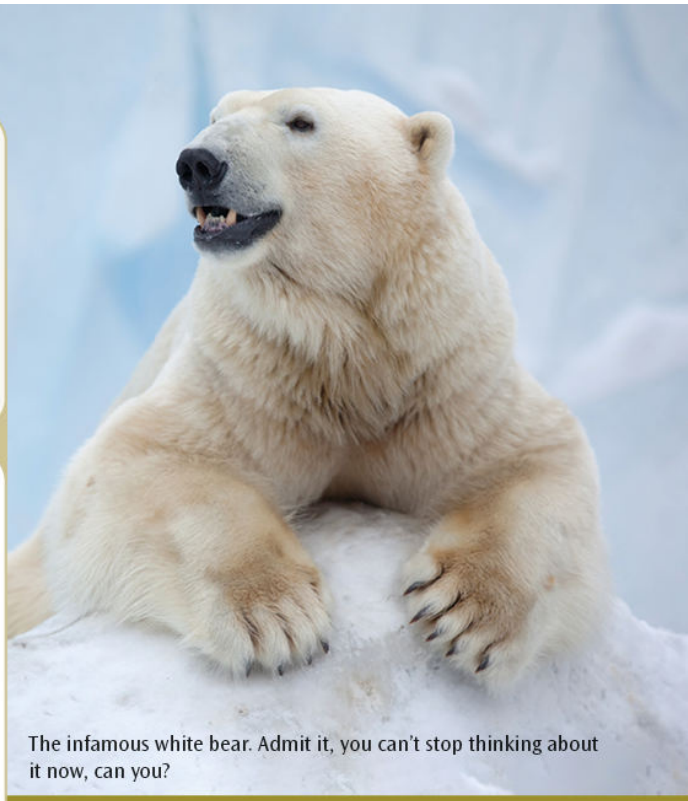
Your participants will tap on the table every time they become aware of a biscuit-related thought, so you need to keep a careful record of these. You should also time each three-minute session accurately, using a stopwatch or phone app.

Extending the practical

The most relevant way you could extend this activity is to see if there is a difference between dieters and non-dieters. Are you more likely to find an *ironic rebound effect* in people who are currently trying to lose weight? Also, if you wanted to add more scientific rigour, consider **randomly allocating** your participants to the task orders. Decide in advance, and using a random method, which participants will carry out the suppression task first.

Analysing your data

The key measure is the number of taps given in the expression task. This is the **dependent variable**. If ironic processes are at work, we would expect to find more biscuit-related thoughts in the expression task when the suppression task is carried out first. Because these participants have tried to suppress these thoughts, they think about them more when given the opportunity. This is evidence of an ironic rebound effect. You could present your findings in a table like the one on the right, and carry out a statistical test.



The infamous white bear. Admit it, you can't stop thinking about it now, can you?

Apply it
Methods

The maths bit 2

1. In the study described on the left, which measure of central tendency would you use to summarise the data? Explain your answer. (*1 mark + 2 marks*)
2. For each column in Table 2 below, calculate the measure of central tendency you identified in your answer to question 1. (*1 mark + 1 mark*)
3. Which statistical test would you use to analyse the difference between the two sets of data? Give *three* reasons for your choice. (*1 mark + 3 marks*)
4. Use the test you identified in your answer to question 3 to obtain a calculated value for the data below. Is the outcome of the test significant or not? Explain your answer. (*1 mark + 3 marks*)
5. Draw a suitable graph to present the data. Identify the graph you have drawn. (*3 marks + 1 mark*)

Table 2 Number of taps given.

Suppression task followed by expression task	Expression task followed by suppression task
7	10
12	3
9	13
12	9
10	6
6	7
9	6
14	3
10	5
11	9

Revision summaries

Explanations for food preferences

Evolutionary

Preferred tastes are adaptive.

The evolutionary explanation

Preferences
Food preferences gave distant ancestors adaptive advantage.

Preference for sweetness Indicates high-energy food so newborns like fructose, present in ripe fruit (Steiner).

Preference for salt For cell functions. Appears at 4 months but innate. Breastfed babies prefer salted cereal (Harris *et al.*).

Preference for fat High in calories but often unavailable to ancestors. Adaptive because most efficient way to get energy.

Neophobia
Fear of new foods is adaptive because it helps us avoid foods that might be harmful. Most pronounced under 6 years.

Taste aversion
Biological preparedness (Seligman), being able to quickly learn an aversion to harmful foods (e.g. bitter taste) is adaptive and increases survival chances.

Evaluation

Research support
We prefer high-fat foods when stressed, fuels fight or flight response (Torres *et al.*).

Neophobia no longer adaptive
Food now safer than ever but neophobia persists, restricting children's diet variety.

Individual differences in taste aversion
People differ in detecting PROP, inherited so hard to explain (Drewnowski *et al.*).

Counterpoint – PROP insensitivity adaptive, anti-cancer.

Evaluation extra: Cultural and evolutionary influences
Culture important in food preferences (Cashdan), but cross-cultural similarities suggest shared evolutionary factors.

The role of learning

We learn to prefer certain foods.

The role of learning

Classical and operant conditioning
Classical conditioning – flavour–flavour, associate new flavour with one we like. Sweeten new foods.

Operant conditioning – parents reinforce or punish food preferences.

Social influences
Social learning theory – family, peers, media model eating behaviours, direct and indirect reinforcement.

Cultural influences
Cultural norms influence preferences (e.g. meat or offal eating). Classical conditioning (associate with good times) and vicarious reinforcement (cultural events).

Evaluation

Lack of support for classical conditioning
Students showed no preference for new flavours when paired with a sweet taste (Baeyens *et al.*).

Counterpoint – also showed an aversion acquired when new tastes were paired with Tween (bitter).

Support for SLT
Children preferred taste of yoghurt drink after teacher modelled enjoying the drink (Jansen and Tenney).

Role of culture
Cultural changes (more food available outside home) have influenced food preferences (e.g. for fast foods which are fatty, salty etc.).

Evaluation extra: Short- and long-term
Short-term media effects on unhealthy food preferences (Hare-Bruun *et al.*), but friends may be long-term influencers.

Neural and hormonal mechanisms

Biological basis of on and off switches.

Explanations

The role of the hypothalamus
Hypothalamus regulates blood glucose by adjusting secretion of insulin and anti-insulin hormones.

Dual-centre model of eating behaviour
Lateral hypothalamus (LH, feeding centre) – on-switch, activated when glucose levels drop. Creates hunger and motivation to eat, secretes neuropeptide Y (NPY).

Ventromedial hypothalamus (VMH, satiety centre) – off-switch, activated when glucose levels rise. Inhibits LH and creates feeling of fullness and end of eating.

The role of ghrelin
Appetite-stimulating hormone from the stomach, detected by the arcuate nucleus of the hypothalamus, signals LH to produce NPY, associated with feelings of hunger.

The role of leptin
Appetite-suppressing hormone from adipose cells. Involved in satiety mechanisms (VMH) and eating stopped.

Evaluation

Research support for dual-centre model
VMH lesions in rats cause hyperphagia/obesity, LH lesions cause aphagia/starvation (Hetherington and Ranson, Anand and Brobeck).

Counterpoint – lesions also damaged the paraventricular nucleus, if this excluded then no hyperphagia (Gold).

Oversimplified models
Hormone CCK a more powerful appetite suppressant than leptin, other biochemicals involved too (Valassi *et al.*).

Social and cultural factors underplayed
More influential than neurochemistry in everyday eating onset (Woods).

Evaluation extra: Animal research
Mechanisms in humans and animals similar, but animal research omits social/cultural/psychological factors.

Biological explanations for anorexia nervosa

Anorexia (AN) has multiple symptoms and causes.

Genetic explanation

Anorexia runs in families
AN concordance of 56% for MZ and 5% for DZ (Holland *et al.*). Rates lower but strong in other studies.

Candidate genes
Ephx2 only gene of 152 linked with AN, involved in cholesterol metabolism (Scott-Van Zeeland *et al.*).

Genome-wide association studies
No genetic variations linked with AN, but study not sensitive enough to find them (Boraska *et al.*).

Evaluation

Limitation of twin studies
Lack validity because MZ twins are treated as more similar than DZ twins, so *equal environments assumption* may be wrong.

Polygenic basis
Show AN is polygenic, many genes with small contributions.

Evaluation extra: Diathesis-stress
Genes create a diathesis (predisposition), but controllable environmental stressors (e.g. dieting) contribute.

Neural explanation

Serotonin
AN linked with underactive serotonin system, e.g. low levels of *5-HIAA* (Bailer and Kaye).

Dopamine
Lower *HVA* levels in recovered AN patients (Kaye *et al.*), AN participants experience anxiety if dopamine increased, eating reduces dopamine (Bailer *et al.*).

Evaluation

Research support
HVA levels 30% lower in participants with AN than controls (Kaye *et al.*).

Oversimplistic
Neurotransmitters such as noradrenaline and possibly GABA interact with serotonin (Nunn *et al.*).

Evaluation extra: Drug treatments
Drugs may relieve symptoms/prevent relapse, but no drug is consistently successful.

Family systems theory (FST)

Family as a complex social system.

The theory

Enmeshment
Family over-involved, poorly defined roles, adolescent daughter lacks self-identity, AN gives independence.

Overprotectiveness
Family members reinforce loyalty and dependence by nurturing one another obsessively (Palazzoli).

Rigidity
Circumstances change and family cannot adapt. Child's attempts at independence are not accepted.

Conflict avoidance
Family members avoid and suppress discussion of problems (e.g. AN).

Autonomy and control
Person with AN strives to assert her independence against domineering mother by starving herself (Bruch).

Evaluation

Research support
Disturbances of autonomy in females with AN, not found in healthy controls (Strauss and Ryan).

Counterpoint – families with AN no more enmeshed/rigid than other families (Aragona *et al.*).

Therapy application
Behavioural family systems therapy reduces family enmeshment, over 50% success in AN (Robin *et al.*).

Mediating factors
Family factors only affect AN in people who are anxious (Davis *et al.*), depressed (Young *et al.*).

Evaluation extra: Validity of FST
Can explain AN in adolescence and in females, but not at other ages and in males.

Explanations for obesity

Biological explanations

Obesity has multiple causes.

Genetic explanation

Obesity runs in families
20% to 50% concordance rates for first-degree relatives (Chaput *et al.*).
61% to 80% genetic component from twin studies (Nan *et al.*).

Polygenic determination
97 genes linked to BMI variations but only accounts for 2.7% of variation (Locke *et al.*).
Heritability of obesity could involve 400 genes making small but important contributions (Watson).

Evaluation

Plausible biological mechanism
Genes may influence sensitivity to food-related cues, and influence neurotransmitter systems linked with obesity (O'Rahilly and Farooqi).

Unexpected findings
Genes for leptin and leptin receptors not linked to obesity, challenges genetic explanation (Paracchini *et al.*).

Evaluation extra: Diathesis-stress
Genes create a diathesis, but triggered by controllable environmental stressors.

Neural explanation

Serotonin
Low levels (may be inherited), inaccurate satiety signals to hypothalamus, leads to disinhibition.

Dopamine
Obese people have fewer dopamine D2 receptors (Wang *et al.*)., dopamine levels lower, reduces pleasure response to eating.

Evaluation

Evidence for serotonin
'Knockout' mice with no serotonin 2C receptors become obese (Ohia *et al.*).

Evidence for dopamine
One version of the *DRD2* gene (B1 allele) twice as prevalent in obese people (Spitz *et al.*).

Evaluation extra: Drug treatments
Neural explanations lead to drug treatments, but drugs have side effects and therefore short-term use whereas obesity is chronic.

Psychological explanations

Restricting may result in obesity.

Explanations

Restraint theory
Dieters preoccupied with food, ignore physiological signals of hunger and satiety. Paradoxical outcome – disinhibited overeating (Herman and Polivy).

Disinhibition
Restrained eating makes you sensitive to food-related cues, leads to disinhibition, maintained by distorted thinking (all-or-nothing).

The boundary model
Hunger motivates eating, satiety motivates stopping. Restrained eaters have wider ZBI – eating under cognitive control, so disinhibition (Herman and Polivy).

Evaluation

Research support
Restrained eaters consumed more calories overall because of occasional disinhibited eating (Wardle and Beales).
Counterpoint – short-term study, over six years restrained eating was associated with weight loss (Savage *et al.*).

Food-related cues
Restrained eaters ate more after viewing food-related cues but not neutral cues (Boyce and Kuijer).

Restraint is complex
There are two forms (rigid and flexible) but only rigid leads to obesity.

Evaluation extra: Research methods
Lab experiments can establish causes of obesity but they are affected by demand characteristics.

Explanations for the success and failure of dieting

Failure is more common than success.

Explanations

The spiral model
Body dissatisfaction leads to dieting, failure leads to depression, try harder, more distress, disinhibited eating and metabolic changes e.g. ghrelin (Heatherton and Polivy).

Ironic processes theory
Dieters label some foods as 'forbidden' but this means they think about them more because they are trying not to, leading to disinhibition (Wegner).

Disinhibition and dieting
Restrained eating leads to distress combatted by eating (spiral model), constant reminders of food (ironic processes) – leads to disinhibition, overeating and failed diet.

Evaluation

Real-world application
Raise self-esteem to break out of 'downward spiral', then dieting is not necessary (Lowe and Kleifield).

Support for ironic processes theory
Trying not to think about a snack led to thinking about it more and increased calorie intake i.e. ironic rebound (Adriaanse *et al.*).
Counterpoint – ironic processes are small/short-term in studies but real-world dieting takes much longer (e.g. self-esteem more important).

Individual differences
Some people lose weight even when preoccupied with food (e.g. anorexia nervosa), perhaps internal locus of control (Ogden).

Evaluation extra: Is dieting pointless?
Diets succeed if improve self-esteem and avoid viewing foods as 'forbidden', but drive to eat is adaptive, we just overeat when food plentiful.

Psychological explanations for anorexia nervosa

Social learning theory

Indirect and direct reinforcement.

The theory

Modelling
AN can be learned indirectly through observation of real or symbolic models, especially if the observer identifies with the model.

Vicarious reinforcement
An observer is more likely to imitate a model's eating behaviours when the model is rewarded (e.g. with praise).

Role of the media
Media promotes thin ideal body shape. Young women (and men) may identify with thin media figures and gain vicarious reinforcement.

Research on SLT and anorexia
Girls shown images of Barbie, Emme or flowers. Those who saw Barbie images expressed more body dissatisfaction (Dittmar *et al.*).

Evaluation

Research support
Fijian girls with high EAT-26 scores increased from 13% (1995) to 29% (1998) after TV introduced (Becker *et al.*).
Counterpoint – study used two different samples with 1998 girls not measured for eating attitudes before TV introduced.

SLT explains cultural changes
AN in Japan has increased as cultural ideals of body shape are influenced by media (Chisuwa and O'Dea).

No effective therapies
Presenting healthy models is not enough for therapy, so explanation of limited use (unlike e.g. biological/cognitive explanations).

Evaluation extra: Validity of SLT
SLT explains AN in young women (media, high incidence), but should be more cases if that was only explanation (a diathesis).

Cognitive theory

Maladaptive and faulty thinking.

Cognitive distortions

Factor 1 – Disturbed perceptions
Preoccupations with thoughts of weight and body shape.
People with AN overestimated their body size and had a thinner ideal shape than non-AN controls (Williamson *et al.*).

Factor 2 – Irrational beliefs
People with AN hold illogical beliefs about body size and shape and eating behaviour, e.g. all-or-nothing thinking, catastrophising and especially perfectionism (raise standards each time they reach goal).

Factor 3 – Cognitive inflexibility
People with AN have problems with set-shifting because they apply weight loss skills to a changed situation where they are no longer needed (Treasure and Schmidt).

Evaluation

Research support for disturbed perceptions
Brain scans show less activation when people with AN view their own bodies not bodies in general (Sachdev *et al.*).

Research support for perfectionism
Perfectionism in childhood retrospectively recalled (EATATE), linked with current symptoms of AN in adults (Halmi *et al.*).
Counterpoint – retrospective recall, data in Halmi *et al.*'s study is likely to be distorted.

Contradictory research
No difference between women diagnosed with or without AN in their estimates of own body size, so no body perception distortion in AN (Cornelissen *et al.*).

Evaluation extra: Issues of causation
Cognitive factors are causal in AN, but could be consequences, e.g. body preoccupation (Murphy *et al.*).

Practice questions, answers and feedback

Question 1 In relation to food preferences, explain what is meant by 'neophobia' and 'taste aversion'. (*4 marks*)	
Morticia's answer *Neophobia is a fear of new foods. Taste aversion is an avoidance of certain tastes such as bitterness because foods with such tastes might be a sign of being bad for you. The same is true for neophobia. Children often overcome such fears and avoidance by following what their parents do.*	Morticia has outlined both terms - albeit rather concisely – and there is relevant additional information at the end.
Luke's answer *Neophobia is an innate predisposition to avoid eating new things. This is an adaptive behaviour because it prevents children just putting anything in their mouths that might be poisonous.* *Taste aversion is also innate. It is also an innate predisposition to avoid certain tastes such as bitter tastes because toxic foods often taste bitter.* *The fact that both of these are hardwired happens because individuals without such innate predispositions are much more likely to die.*	A more impressive answer from Luke that makes much more of the fact that these behaviours may be innate tendencies. Both are clearly outlined.
Vladimir's answer *Both neophobia and taste aversion are behaviours that protect the survival of young children because they prevent them trying unknown foods or foods that can be dangerous. Genes for such predispositions are naturally selected because they increase survival. These predispositions explain why children in particular don't like new foods or bitter tastes.*	Whereas the previous two answers included clear outlines of the concepts, Vladimir has only talked about both in general terms. There's lots of knowledge shown but not focused on the question.

Question 2 Sophie and Sahal are comparing what they had for breakfast. Sophie had apricot jam on toast, something she has had for as long as she can remember. Sahal had canjeero, a bread that looks a bit like a pancake, with a goat stew. He explains how he used to have it with camel meat when he was growing up in Somalia. Explain **two** ways in which cultural influences affect Sophie's and Sahal's breakfast preferences. (*4 marks*)	
Morticia's answer *It is obvious from the description that Sophie and Sahal come from two different cultural backgrounds because they are eating foods which are culturally distinct.* *It is likely that they learned to like these foods when they were young and these were the foods provided at home. Children model their eating behaviour on their parents, assuming that what they eat is safe.*	The first half of Morticia's answer is common-sense and not worthy of credit. There is a reference to 'modelling' in the second paragraph, but it is easy to become quite anecdotal so candidates need to ensure they use appropriate psychological terms.
Luke's answer *One cultural influence is the norms that we are exposed to. We are surrounded by supermarkets and restaurants and food on TV, which informs us about what is the typical food that people in our culture eat. These media influences are related to culture.* *A second cultural influence is what you are given to eat at home. In some homes children might not have meat and this would influence their food preferences because they would continue to feel afraid of this new food. They would grow up to continue to be vegetarian.*	Luke's first factor – that of cultural norms – is relevant and there is elaboration but this is not linked to the stem. The second factor is also relevant and, again, elaborated. Application to the characters in the stem is again absent though.
Vladimir's answer *Culture has a major influence on what we learn to eat. It helps children overcome their fear of new foods and taste aversions.* *Sahal would have been served canjeero for breakfast at home and learned to like the taste. He would have modelled what his parents ate, trusting that it was safe. They would have rewarded him for eating up. It would have been the same for Sophie, which explains why they developed such different tastes.* *In addition the media show children the norms for their culture and this emphasises what they learn at home.*	The first sentence in Vladimir's answer is redundant really as a specific factor is not identified. The issue of modelling is made clear in paragraph 2 and this is linked to the stem – though the outline lacks detail (just about worth middle-range credit). The influence of the media is not linked to food preference so does not add anything further.

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

Question 3 Describe **and** evaluate biological explanations for anorexia nervosa. (*16 marks*)

Morticia's answer *Anorexia is a severe and potentially fatal disorder that affects as much as 1.2% of the population at any time. Far more females than males are affected, though the number of males is increasing. There are many explanations for anorexia nervosa (AN), some are psychological and some are biological. The main biological explanation is related to genes. This is because research shows that anorexia does run in families. In other words if your mother had anorexia it is more likely that you might develop it than someone who didn't have a mother with anorexia. Or if you are an identical twin who has exactly the same genes as your twin it is more likely that you both have AN than if you are non-identical twins who only share about 50% of their genes.* *It may be that there are specific candidate genes for AN and research has identified some but it is unlikely that there is just one gene. It is more likely that it is a number of different genes and these will affect different aspects of behaviour such as obsessiveness or control switches for eating.* *The problem with twin studies and genetics is that twins share the same environment so it could equally be their shared environments that is causing the similarity, such as a home environment that is full of conflict. Though MZ twins are more similar than DZ twins and the equal environments assumption is wrong.* *There are also neural explanations for AN. One possibility is serotonin, which may have an effect on appetite. It may make people feel less hungry. Another neurotransmitter that may be important is dopamine because people with AN react differently from people without AN.* *Of course genetic and neural explanations are linked because the genes would lead to abnormal levels of neurotransmitters such as serotonin and dopamine.* *The biological explanations might explain the gender difference in who is affected though that is more likely to be due to a social explanation, i.e. social learning theory. This can explain why AN is common in individualist cultures but not others.* *In fact the best explanation is always going to be the diathesis-stress model, which suggests that individuals have some kind of innate vulnerability, which might be due to their genetic inheritance but they only develop the disorder if something else happens – some kind of stressor which triggers the disorder. This explains why concordance levels between identical twins are never 100%. There is always some environmental input.* **(413 words)**	The first three sentences are not required – far better to get straight to the explanation. A rather generic account here without specific evidence. In paragraph 2 there is a relevant evaluative comment. Paragraph 3 provides a relevant point but could be more directly applied to anorexia. The next paragraph contains a weak account of the neural basis of anorexia, particularly the dopamine link. The remaining points require further analysis and the explanation of diathesis-stress at the end is not made relevant to anorexia. Overall, this essay contains too many generic and unsubstantiated points.
Luke's answer *There are two main biological explanations: genetic and neural. The genetic explanation proposes that certain genes actually cause anorexia. Scott-Van Zeeland et al. looked at 152 candidate genes suspected to be linked with features of anorexia and found only one with a significant association. This codes for an enzyme involved in cholesterol metabolism which is something that is abnormally high in people who have very bad cases of anorexia.* *An alternative approach is to focus more widely instead of on specific genes. A study by Boraska et al. didn't find any patterns that were significantly related to anorexia but argued that this was because their study was not sensitive enough to detect them.* *Twin studies have been used as support for genetic explanations but there are criticisms of such studies because they assume that both identical and non-identical twins share identical environments. However, there is reason to believe that identical twins are treated much more the same because they look identical and act in similar ways, and therefore higher concordance rates may be due to this.* *Research focused on identifying candidate genes has been criticised because the cause is likely to be polygenic and affect many different behaviours. To look for one root cause and a biological basis for this is to oversimplify anorexia.* *The second biological explanation relates to neurotransmitters. Serotonin is implicated in anorexia in appetite reduction and obsessiveness. Bailer and Kaye reviewed a number of studies and concluded that there appear to be low levels of serotonin metabolites in people with anorexia. Similarly, research has also looked at dopamine (e.g. Kaye et al.) and found low levels of dopamine metabolites. These results suggest low levels of both serotonin and dopamine in people with anorexia.* *Kaye et al. produced strong supporting evidence that controlled for confounding variables because people who no longer have anorexia with normal weight and not restricted food intake were studied – both factors that may affect dopamine levels. The people who no longer had anorexia still had lower HVA levels.* *One issue for neural explanations is that it is probably unrealistic to think that neurotransmitters act on their own. It is probably better to explain anorexia in terms of an interaction between dopamine, serotonin and also GABA.* *A further danger is to consider that biological explanations may be functioning on their own. The diathesis-stress model proposes that biological factors merely act as a vulnerability which on their own won't lead to anorexia. It takes psychological factors such as stressors to act as a trigger for the disorder.* **(420 words)**	Luke begins with some clear and precisely presented evidence which was all but absent in Morticia's account. In paragraph 2 there is good use of evidence plus counterargument. In paragraph 3 a specific twin study may have been useful so the point looks a little generic. Paragraphs 4 and 5 provide a well-made point followed by a much more sophisticated account than was provided by Morticia, including relevant evidence. In paragraph 6 a good methodological evaluation is provided, finally followed by a conclusion based on diathesis-stress (which is a little better applied than Morticia's).

Multiple-choice questions

Explanations for food preferences: Evolutionary

1. Humans have a preference for sweet-tasting foods because they:
   (a) Provide salt for crucial cell functions.
   (b) Are an important source of protein.
   (c) Are a fast-acting source of energy.
   (d) Are always safe to eat.

2. Neophobia is adaptive because:
   (a) It means we eat a varied diet.
   (b) We don't eat potentially toxic foods until we learn they are safe.
   (c) We learn quickly to avoid certain foods.
   (d) It forces us to eat a wide range of nutrients.

3. The development of taste aversions is mainly due to:
   (a) Neophobia.
   (b) A preference for bitter tastes.
   (c) Biological preparedness.
   (d) Cultural influences.

4. Insensitivity to bitter compounds is:
   (a) An example of neophobia.
   (b) A learned characteristic.
   (c) Always maladaptive.
   (d) Beneficial because bitter foods may have anti-cancer properties.

Explanations for food preferences: The role of learning

1. Liking a new food because we associate it with a preferred taste is an example of:
   (a) Social learning.
   (b) Flavour–flavour learning.
   (c) Cultural influences.
   (d) Imitation.

2. An adaptive function of modelling in children is to:
   (a) Learn from parents which foods are safe.
   (b) Prevent them eating too many high-calorie foods.
   (c) Learn to dislike vegetables because they taste bitter.
   (d) Learn which foods to eat from media advertising.

3. Culture influences children's food preferences by:
   (a) Causing them to dislike bitter-tasting foods.
   (b) Influencing neophobia.
   (c) Determining the preference for energy-giving foods.
   (d) Determining what parents choose to put on the table.

4. According to Hare-Bruun *et al.*'s study, the social learning effects of TV advertising are mainly:
   (a) On girls' preferences.
   (b) Short-term.
   (c) Permanent.
   (d) More important than family influences.

Neural and hormonal mechanisms in the control of eating behaviour

1. The ventromedial hypothalamus is:
   (a) A feeding centre.
   (b) Involved in stimulating appetite.
   (c) Activated when glucose levels rise above a set point.
   (d) Associated with neuropeptide Y.

2. Ghrelin:
   (a) Is produced by adipose cells.
   (b) Triggers hunger when it rises above a certain level.
   (c) Suppresses appetite.
   (d) Is a neurotransmitter.

3. Leptin:
   (a) Increases in the bloodstream just before a meal.
   (b) Is detected by receptors in the ventromedial hypothalamus.
   (c) Is associated with feelings of hunger.
   (d) Is secreted by the stomach.

4. The dual-centre hypothesis is limited because it:
   (a) Fails to recognise the true complexity of control of eating behaviour.
   (b) Ignores the role of glucose levels.
   (c) Argues that cultural influences on eating are more important than biological ones.
   (d) Fails to account for the role of the ventromedial hypothalamus.

Biological explanations for anorexia nervosa

1. A gene identified by Scott-Van Zeeland *et al.* is:
   (a) Involved in serotonin metabolism.
   (b) Known as GWAS.
   (c) Involved in cholesterol metabolism.
   (d) The only cause of AN.

2. Serotonin is implicated in AN because:
   (a) Levels of homovanillic acid are lower in people with AN.
   (b) Research shows levels of *5-HIAA* are lower in people with AN.
   (c) There is overactivity of the serotonin system.
   (d) Amphetamines cause anxiety in people with AN.

3. A problem with gene studies of AN is:
   (a) There are at least two different types of study: CGAS and GWAS.
   (b) One gene cannot explain all the symptoms of AN.
   (c) They cannot be replicated.
   (d) AN does not have a genetic basis.

4. According to Nunn *et al.*:
   (a) Serotonin interacts with noradrenaline in AN.
   (b) Dopamine activity is the central feature of AN.
   (c) Serotonin levels can explain all features of AN.
   (d) GABA is the most important neurotransmitter in AN.

Psychological explanations for anorexia nervosa: Family systems theory

1. FST focuses mainly on:
   (a) The father–daughter relationship.
   (b) Individuals with AN.
   (c) The mother–daughter relationship.
   (d) The role of culture.

2. A lack of individual self-identity within the family is an example of:
   (a) Rigidity.
   (b) Over-protectiveness.
   (c) Enmeshment.
   (d) Conflict avoidance.

3. According to Bruch, a lack of autonomy can lead to:
   (a) Distorted body image.
   (b) Over-sensitivity to feelings of hunger.
   (c) A wish to be more dependent.
   (d) A feeling of being independent.

4. Factors that 'come between' family interactions and AN are called:
   (a) Mediating factors.
   (b) Meditating factors.
   (c) Median factors.
   (d) Medicating factors.

Psychological explanations for anorexia nervosa: Social learning theory

1. Models are likely to be imitated when:
   (a) Their eating behaviour is frowned upon by others.
   (b) They have the same status as the observer.
   (c) The observer identifies with them.
   (d) The observer is praised for losing weight.

2. Dittmar *et al.* found that:
   (a) Girls who saw Barbie images had a lack of body esteem.
   (b) The control images had the greatest effect.
   (c) Girls who saw Emme images had more body dissatisfaction.
   (d) Exposure to Barbie dolls caused AN.

3. Magazines aimed at young women influence AN because:
   (a) They include a lot of articles about AN.
   (b) They reflect the full variety of body shapes in society.
   (c) Most young women are very impressionable.
   (d) They promote cultural ideals about a thin body shape.

4. Chisuwa and O'Dea studied young women in:
   (a) Japan.
   (b) Ireland.
   (c) US.
   (d) UK.

Psychological explanations for anorexia nervosa: Cognitive theory

1. **Evidence that people with AN show cognitive distortions is that they:**
   (a) Only think of food when they are hungry.
   (b) Take little interest in their appearance.
   (c) Never try hard to succeed.
   (d) Consistently overestimate their body size.

2. **Perfectionism is an example of:**
   (a) Misinterpreting body size and shape.
   (b) A failure of set-shifting.
   (c) Automatic negative thinking.
   (d) An irrational belief.

3. **People with AN have difficulty in 'set-shifting'. This means:**
   (a) They are cognitively very flexible.
   (b) They are perfectionists.
   (c) They carry on applying old skills to new situations.
   (d) They misinterpret their emotional states.

4. **Halmi *et al.*'s study can be criticised because:**
   (a) Perfectionism was an effect of AN and not the cause.
   (b) Measurement of perfectionism was retrospective.
   (c) AN was not linked to perfectionism.
   (d) Some women with AN were more perfectionist than others.

Biological explanations for obesity

1. **The contribution of genes to obesity suggested by twin studies is:**
   (a) Less than 10%.
   (b) 30–50%.
   (c) 51–60%.
   (d) More than 61%.

2. **In terms of neurotransmitters, obesity seems to be linked with:**
   (a) Abnormally high levels of dopamine.
   (b) Low serotonin levels combined with high dopamine levels.
   (c) Abnormally low levels of serotonin.
   (d) Higher numbers of dopamine receptors in the brain.

3. **The most likely genetic influence on obesity is:**
   (a) A single gene as the primary cause.
   (b) Many genes interacting to make small but significant effects.
   (c) A few genes, some with greater effects than others.
   (d) A problem with the gene that determines leptin activity.

4. **Evidence for dopamine's role in obesity is:**
   (a) Dopamine activity is determined by *5-HT2C* receptors.
   (b) Higher levels of *5-HIAA* in obese people.
   (c) Fewer D2 receptors in the brains of obese people.
   (d) The amygdala is overstimulated in obese people.

Psychological explanations for obesity

1. **Restrained eaters often fail to lose weight because they:**
   (a) Are sensitive to physiological signals of hunger.
   (b) Become preoccupied with food.
   (c) Have no willpower.
   (d) Have low self-esteem.

2. **According to the boundary model, restrained eaters:**
   (a) Stop eating if they break their diet boundary.
   (b) Have a lower hunger boundary than normal eaters.
   (c) Notice when they are full more quickly than normal eaters.
   (d) Have a narrower 'zone of biological indifference'.

3. **Dieters consume more calories than normal eaters because they:**
   (a) Are constantly eating more food.
   (b) Only eat high-calorie food.
   (c) Have occasional periods of disinhibited eating.
   (d) Don't think about what they eat.

4. **Media images of thinness can contribute to obesity because:**
   (a) They act as disinhibitors of eating behaviour.
   (b) Obese people do not have as much willpower as celebrities.
   (c) They reinforce the obese person's desire to be thin.
   (d) Most people find such images inspiring.

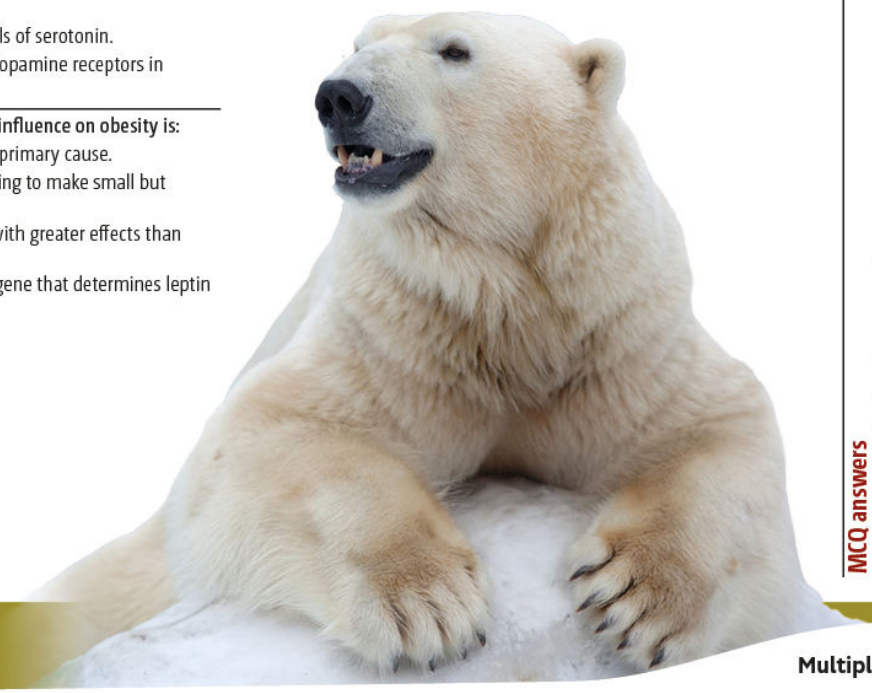
Explanations for the success and failure of dieting

1. **The spiral model argues that:**
   (a) Most dieters will stop dieting when they see it doesn't work.
   (b) The more someone diets, the easier it is to lose weight.
   (c) Dieters who fail to lose weight usually blame themselves.
   (d) The more a dieter tries not to think about food, the more they do so.

2. **According to ironic processes theory, one way to lose weight is:**
   (a) Monitor your food intake more carefully.
   (b) Join a slimming programme such as Weightwatchers.
   (c) Raise self-esteem.
   (d) Distract yourself by thinking of something other than food.

3. **Adriaanse *et al.* found that people who tried to avoid unhealthy snacks:**
   (a) Thought about unhealthy snacks but didn't eat more.
   (b) Switched to healthier snacks instead.
   (c) Had low self-esteem.
   (d) Ate more unhealthy snacks.

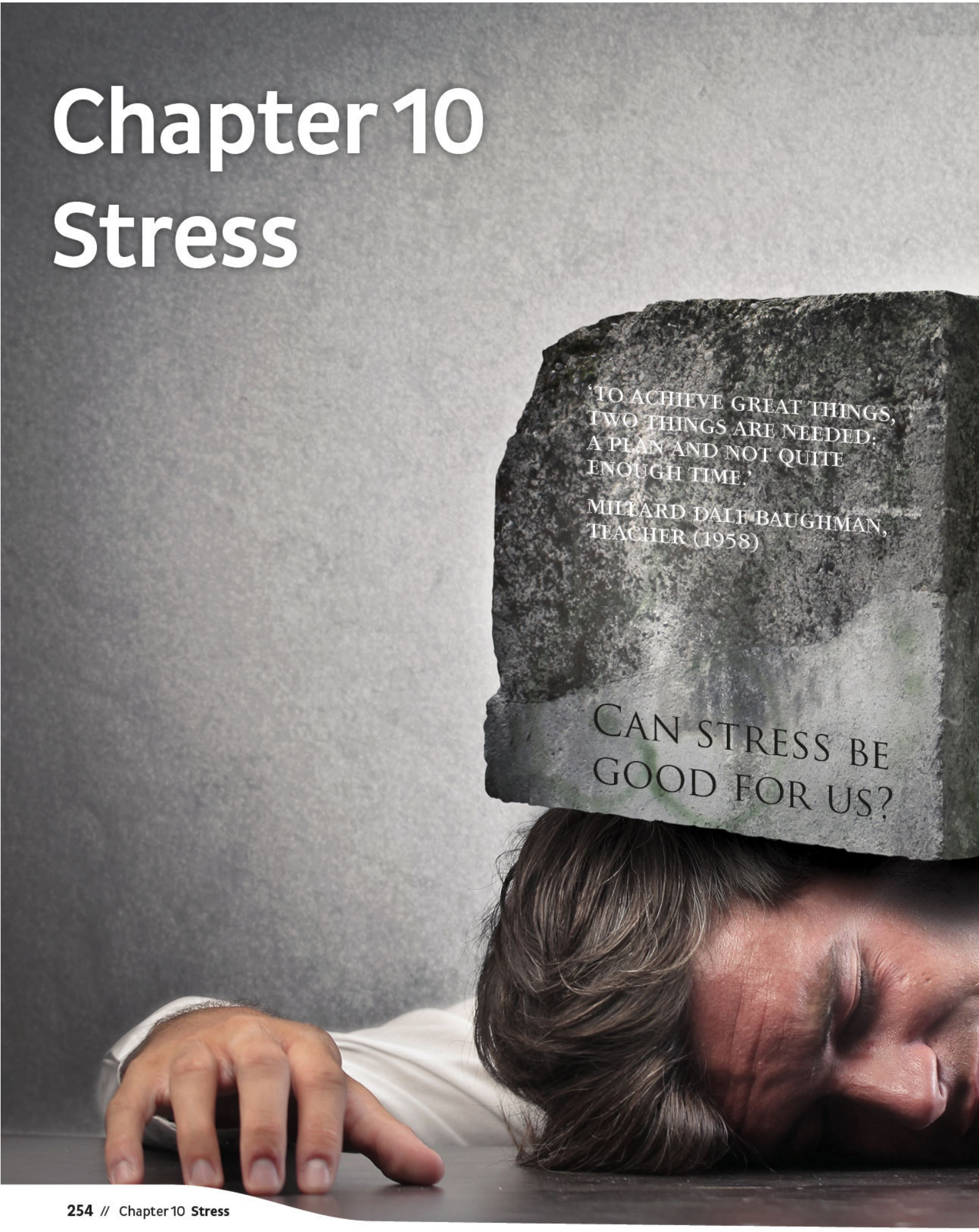
4. **Ironic processes in dieting:**
   (a) Are more important than self-esteem.
   (b) Matter more in studies than in the real world.
   (c) Are measured in studies over years.
   (d) Have a relatively small effect.



MCQ answers

Explanations for food preferences: Evolutionary 1C, 2B, 3C, 4D
Explanations for food preferences: The role of learning 1B, 2A, 3D, 4B
Neural and hormonal mechanisms in the control of eating behaviour 1C, 2B, 3B, 4A
Biological explanations for anorexia nervosa 1C, 2B, 3B, 4A
Psychological explanations for anorexia nervosa: Family systems theory 1C, 2C, 3A, 4A
Psychological explanations for anorexia nervosa: Social learning theory 1C, 2A, 3D, 4A
Psychological explanations for anorexia nervosa: Cognitive theory 1D, 2D, 3C, 4B
Biological explanations for obesity 1D, 2C, 3B, 4C
Psychological explanations for obesity 1B, 2B, 3C, 4A
Explanations for the success and failure of dieting 1C ,2D, 3D, 4D

Chapter 10 Stress





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The physiology of stress

The specification says...

> The physiology of stress, including general adaptation syndrome, the hypothalamic-pituitary-adrenal system, the sympathomedullary pathway and the role of cortisol.

Stress has at least three different meanings in psychology. First, it can be something that happens to us, i.e. some demand our environment makes upon us. Psychologists prefer the word *stressor* to describe these causes of stress. Second, stress can be seen as a *transaction* between a person and their environment. You experience stress when the perceived demands of your environment are greater than your perceived ability to cope with them. Third, stress is a description of how the body physically responds to a stressor.

On this spread, we start by looking at this third meaning.

Key terms

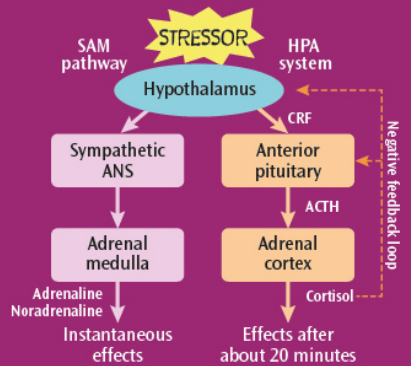
General adaptation syndrome Selye's explanation of how the body responds in the same way to any stressor. The response goes through three stages: alarm reaction, resistance and exhaustion.

Hypothalamic-pituitary-adrenal system (HPA) This controls how the body responds to a chronic stressor. The hypothalamus triggers the pituitary gland to release the hormone ACTH which, in turn, stimulates release of cortisol.

Sympathomedullary pathway (SAM) This controls how the body initially responds to an acute stressor. The sympathetic nervous system triggers the fight or flight response. This includes the hormones adrenaline and noradrenaline which communicate with target organs in the body such as the heart.

Cortisol An important hormone produced by the adrenal cortex. It helps the body to cope with stressors by controlling how the body uses energy. Cortisol suppresses immune system activity.

The physiology of the stress response – the sympathomedullary pathway (left) and the hypothalamic-pituitary-adrenal system (right).



General adaptation syndrome

Hans Selye (1936) viewed **stress** as the body's attempt to adapt to a stressor. This adaptation protects the body in the short term (an acute stressor). But if the stressor is prolonged (chronic) serious damage can occur, including stress-related illnesses. The process of adapting to a stressor goes through three stages, which Selye called the **general adaptation syndrome** (GAS).

1. **Alarm reaction** When a stressor is perceived, the immediate physiological response is 'shock'. At this time the body's resources are briefly decreased (i.e. resistance is lowered) before quickly recovering (see graph on facing page). Physiological systems are activated (as described below in terms of acute and chronic stress) in preparation for fight or flight.
2. **Resistance** The body attempts to adapt to the stressful environmental demands by resisting the stressor. Physiological activity is greater than normal and uses a lot of energy. The individual appears to be coping but the body's resources are being consumed at a potentially harmful rate. For instance, stress hormones are produced in huge quantities and will soon be depleted. So the **parasympathetic nervous system** is activated to conserve energy for the longer term, because the stressor is becoming chronic.
3. **Exhaustion** Adaptation to a chronic stressor is now failing. The body's resources have become drained, so resistance plummets. The individual begins to re-experience the symptoms of sympathetic arousal that first appeared in the alarm stage (for example, sweating, raised heart rate and blood pressure, and so on). The adrenal glands may become damaged and the **immune system** compromised. Stress-related illnesses or *diseases of adaptation* (as Selye called them) are now likely, such as raised blood pressure, coronary heart disease and depression.

Physiological stress response

Acute stress – sympathomedullary pathway

You learned about the body's immediate response to an acute stressor as part of biopsychology – this is the **sympathomedullary pathway** (SAM), also called the **fight or flight response** (see page 35).

When an individual perceives a stressor as threatening, the **sympathetic branch** of the **autonomic nervous system** (ANS) is activated by the **hypothalamus**. Sympathetic nerves connect the brain with many organs of the body, such as the heart and various glands including the two **adrenal glands** which sit on top of the kidneys. The **adrenal medulla** is the central part of the gland.

Sympathetic arousal stimulates the adrenal medulla to release the **hormones adrenaline** and **noradrenaline** into the bloodstream. These cause the heart to beat faster, muscles to tense and the liver to convert stored glycogen into glucose which is released into the bloodstream to provide energy to fuel the fight or flight response.

Ultimately the sympathetic response ends either when stress becomes chronic (see below) or the parasympathetic nervous system takes over. The ANS is divided into two branches that have generally opposing effects, the sympathetic and parasympathetic systems. Once a stressor is no longer a threat, the parasympathetic system is activated and the physiological arousal associated with the fight or flight response decreases. The priority now is for energy conservation rather than expenditure, which is why this parasympathetic pattern of activity is sometimes called the *rest and digest response*.

Chronic stress – hypothalamic-pituitary-adrenal system

The body's response to long-term (chronic) stress is activated by the **hypothalamic-pituitary-adrenal system** (HPA). The HPA takes longer than the SAM to activate by a stressor but can persist for several hours, or longer. When the hypothalamus is activated because of a stressor it sends a signal to activate the sympathetic nervous system but also produces a hormone called *corticotropin releasing factor* (CRF). CRF is detected by the anterior lobe of the **pituitary gland** causing the release of *adrenocorticotropic hormone* (ACTH) into the bloodstream. ACTH levels are detected by the **adrenal cortex** (surrounding the adrenal medulla) which secretes the hormone **cortisol** in response.

Cortisol This is often called *the* stress hormone because it has a central role to play in the body's stress response. Some of its functions help the body to cope with a stressor. For instance, cortisol is a *glucocorticoid* because it affects glucose metabolism by mobilising and restoring energy supplies to power the stress response. But it has other effects that are damaging to the body. For instance, cortisol suppresses the immune system (which we will explore on the next spread).

Negative feedback loop The HPA is self-regulating via a *negative feedback loop*. Levels of cortisol circulating in the bloodstream are monitored back at the pituitary and the hypothalamus. High levels of cortisol trigger a reduction in both CRF and ACTH, resulting in a corresponding reduction in cortisol.

Evaluation

Research support

One strength is support for the GAS from Selye's (1936) own research with rats.

He subjected rats to various physical stressors including extreme cold, excessive muscular exercise and surgical injury. He found the same collection of responses occurred (a syndrome) regardless of the stressor. The response appeared after six to 48 hours. Selye was also able to track the rats' continuing responses through the resistance and exhaustion stages.

This demonstrates the same general response regardless of the particular stressor.

GAS may not be general

One limitation of the GAS is that it may not be a general response to all stressors.

John Mason (1971) replicated Selye's procedures using monkeys, measuring response to seven different stressors by measuring levels of urinary cortisol (cortisol is an indicator of stress because it is produced by the HPA). Mason found that the outcomes depended on the stressor. For instance, extreme cold increased cortisol levels, extreme heat reduced them, and excessive exercise produced no changes.

These findings challenge the **validity** of the GAS by showing that specific stressors can produce specific responses.

Evaluation eXtra

Animal research

Research into stress uses non-human mammals for ethical reasons and because the physiological systems in the stress response are almost identical in all mammals.

However, stress in humans is more complex than it is in other mammals. It is affected by psychological factors that are not considered in research with rats. For example, cognitive factors may alter how a person responds to stress (see 'Cognitive appraisal' below).

Consider: *To what extent can animal studies help us understand human stress?*

Evaluation

Real-world application

One strength is that knowledge of the physiology of stress has practical value.

For example, Addison's disease is a rare disorder of the adrenal glands. People with Addison's cannot produce cortisol, so the body cannot mobilise energy to deal with a stressor. The lack of cortisol can trigger a life-threatening Addisonian crisis (mental confusion, abnormal heart rhythm, drop in blood pressure) when a stressor occurs. This knowledge has revolutionised treatment. Individuals can self-administer daily cortisol replacement therapy (hydrocortisone). They should also be aware of stressful situations when they might need an 'extra' injection of hydrocortisone.

Therefore understanding of stress physiology has improved the lives of some people.

Cognitive appraisal

One limitation is that physiological explanations ignore psychological factors in stress.

One such factor is *cognitive appraisal* – working out whether a stressor is a threat (Lazarus 1999). Joseph Speisman *et al.* (1964) asked students to watch a gruesome medical procedure on film while their heart rates were measured. Changes to heart rate depended on how the students interpreted what was happening in the film. If they believed the procedure to be traumatic, their heart rates increased. But if they had been told the procedure was part of a voluntary and joyful rite of passage, their heart rates decreased.

This finding cannot be explained by a purely physiological theory.

Evaluation eXtra

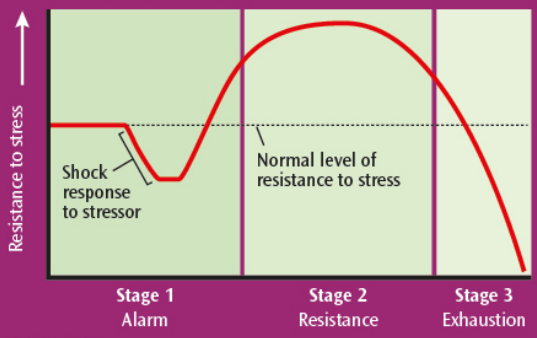
Gender bias

Fight or flight is regarded as the universal physiological response to an acute stressor in animals. This understanding is based on research with male animals – avoiding females because of their hormone fluctuations.

However, Shelley Taylor *et al.* (2000) argue that the most adaptive stress response in females is 'tend and befriend'. It was adaptive for ancestral females to respond to stress by nurturing (tending) offspring and co-operating with other females (befriending). The hormone oxytocin inhibits the fight or flight response in females some of the time.

Consider: *What is the baseline physiological response to stress?*

The three stages of the GAS.
The graph below shows how the body adapts to a stressor by resisting it. Resistance begins during the alarm reaction to the stressor (shock). Stage 2 is peak resistance, which tails off in Stage 3.



Apply it
Concepts

A stressful near miss

Imagine you are sawing a piece of wood when the saw slips and narrowly misses your finger. You realise that you have been lucky. Your heart starts to race and you get a sick feeling in the pit of your stomach. Your mouth goes dry and you start to sweat. But after a few minutes, these symptoms disappear and you feel better.

Question

Use your knowledge of the physiology of stress to explain why these changes came about. Refer to the changes that occurred immediately and to those changes that occur later.

Apply it
Concepts

The stress of caring

Jianping's mother has damaged her spinal cord and is no longer able to look after herself. Jianping is her main carer and has to look after all her physical needs. She has been doing this for two years with hardly any time off. It is a very stressful situation and shows no sign of getting any better. Jianping felt ill recently and went to see her doctor who found that her blood pressure is much too high so she has to take medication. Not surprisingly, she also feels very down a lot of the time.

Question

What kind of stressor is Jianping experiencing? Explain the physiological processes taking place in her body that might account for her high blood pressure.

Check it

1. Outline the main features of the sympathomedullary pathway. *[4 marks]*
2. Outline the hypothalamic-pituitary-adrenal system. *[6 marks]*
3. Explain the role of cortisol in the physiology of stress. *[4 marks]*
4. Discuss the general adaptation syndrome. *[8 marks]*
5. Discuss the physiology of stress. *[16 marks]*

The role of stress in illness

The specification says...

The role of stress in illness, including reference to immunosuppression and cardiovascular disorders.

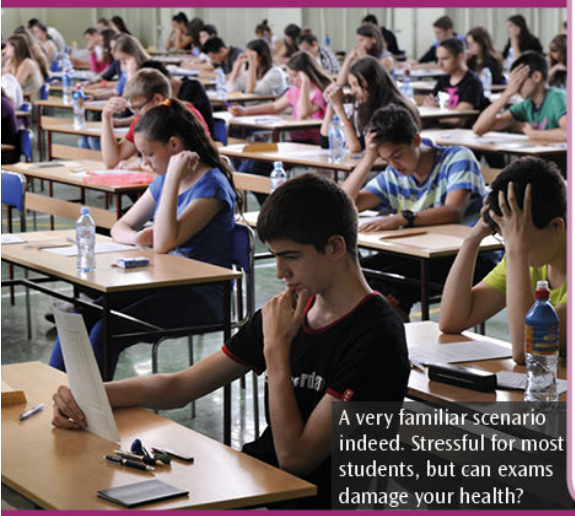
The immune system is our defensive barrier against invading germs and other foreign bodies (*pathogens*).

One line of defence is innate, such as white blood cells (*leucocytes*) and *natural killer (NK) cells*. The second line of defence is *acquired immunity* which is specific to the invading pathogen because it has been encountered before. This acquired response involves *lymphocytes* (including *B cells*) that produce *antibodies* to destroy the pathogens. There are also several types of *T cells*, such as *memory T cells* which recognise pathogens, and *killer T cells* which destroy cells infected with pathogens.

Key terms

Immunosuppression Stress can cause illness by preventing the immune system from working efficiently and carrying out its usual task of identifying and destroying invading germs and other foreign bodies (pathogens).

Cardiovascular disorders Any disorder of the heart (cardio) or blood vessels (vascular) including events that affect the brain (e.g. stroke).



A very familiar scenario indeed. Stressful for most students, but can exams damage your health?

Immunosuppression

Stress can suppress the **immune system** directly. For example, **cortisol** produced by the **hypothalamic-pituitary-adrenal** stress response inhibits production of *lymphocytes*. There are also some indirect **immunosuppressive** effects, for example stress can influence lifestyle behaviours (smoking, drinking, sleep patterns) that in turn have a detrimental effect on immune functioning.

Kiecolt-Glaser's research

Janice Kiecolt-Glaser has investigated the effect of two chronic (long-term) stressors: preparing for exams and looking after relatives who are ill.

Study 1: Procedure Kiecolt-Glaser *et al.* (1984) investigated the effects of exams on 75 medical students. The participants gave blood samples twice, one month before an exam period (low-stress) and on the day of the first exam (high-stress). They also completed questionnaires measuring sources of stress and self-reported psychological symptoms.

Findings The researchers found that the activity of *NK* and *killer T cells* decreased between the first and second samples, evidence of an immune response being suppressed by a chronic stressor. This decline was most apparent in students who reported feeling most lonely and in those experiencing other sources of stress such as significant events in their lives.

Study 2: Procedure Kiecolt-Glaser *et al.* (1991) carried out another **longitudinal study** in which they compared the health of two groups of people – caregivers looking after a relative with Alzheimer's disease, and a **matched** group of non-caregivers.

Findings Over a period of 13 months, the caregivers showed a weaker cell-based immune response. There was no such increase in the **control** participants. The caregivers also had infectious illnesses on **significantly** more days, and higher levels of **depression** with 32% meeting the criteria for clinical depression (only 6% in the control group).

Cardiovascular disorders

There is evidence that stress may contribute to **cardiovascular disorders** (CVDs) such as heart disease and strokes. Acute stress leads to the production of **adrenaline** which affects the heart muscles directly (e.g. increasing heart rate). Repeated high levels of adrenaline can have long-term effects.

Acute stress research

Procedure Sudden emotional arousal is a good example of an acute (short-term) stressor. Ute Wilbert-Lampen *et al.* (2008) looked at incidences of heart attacks in German football supporters during matches played during the 1996 World Cup.

Findings On the days when Germany played, cardiac emergencies increased by 2.66 times compared with a control period. It appears that the acute emotional stress of watching your favourite football team can more than double your risk of experiencing a cardiovascular event.

Chronic stress research

Procedure Salim Yusuf *et al.* (2004) examined chronic stressors in the INTERHEART study. This was an investigation involving 52 countries, to identify major risk factors for CVDs across different cultures. They compared 15,000 people who had had a heart attack (myocardial infarction or MI) with a similar number of people who had not.

Findings They found several chronic stressors with a strong link to MI, including **workplace stress** and stressful **life events** (both covered later in this chapter). The contribution of stress was greater than obesity and third only to smoking and cholesterol levels. Stress not only contributes to the development of CVDs in the first place, it also makes existing disorders worse.

Apply it

Concepts

Stress and healing

Janice and Roxanne are in the same rugby team and a week ago played in their first match together. They both ended up with the usual bruises and grazes, but each of them also had quite bad cuts. Janice's cut appears to be healing nicely, but Roxanne's is taking a lot longer and she has to change the dressing on it frequently. Roxanne has important A level exams coming up at college, but Janice is a year younger and doesn't have any exams.

Question

Use your knowledge of the relationship between stress and illness to explain why Roxanne's wound is taking so much longer to heal than Janice's.

Evaluation

Stress can be protective

One limitation is that some research shows the stress response can make illness *less* likely.

Stress can have immunoenhancing effects. Firdaus Dharbhar (2008) subjected rats to mild acute stressors and found that immune cells (e.g. lymphocytes) flooded into the bloodstream and body tissues in preparation for physical damage. This shows that acute stressors may not have the same immunosuppressive effects as chronic (long-term) stressors.

This suggests that the relationship between stress, the immune system and illnesses is complex and not yet fully understood.

Real-world application

One strength is that research into stress and illness has many potential real-world benefits.

For example, Dharbhar's research into acute stressors (above) could eventually lead to patients being given low doses of stress hormones (adrenaline and noradrenaline) before surgery. This would stimulate their immune systems and improve their chances of making a full and fast recovery afterwards. Other research shows that students who took a relaxation training programme seriously had better immune functioning during an exam period than those who didn't bother with it (Kiecolt-Glaser and Glaser 1992).

These applications benefit real people and confirm the relevance of stress to immune system functioning.

Evaluation eXtra

Research methods

Many studies of the effects of stress on illness are lab experiments. They measure the effects of acute stressors while controlling confounding variables and can therefore establish that stress causes suppression of the immune system that leads to illness.

However, the high control of lab experiments means they are unlike real-world stressful situations. Experiments also feature demand characteristics, which operate so participants behave how they believe the researchers want them to.

Consider: *How useful are lab experiments for studying stress and illness?*

Evaluation

Direct versus indirect effects

One limitation is that the effects of stress on CVDs are mostly indirect.

The evidence for this is much stronger than the evidence that stress directly causes CVDs. For example, Kristina Orth-Gomer *et al.* (2000) found that marital stress tripled the risk of a heart attack in women who already had CVD. This is a different situation from demonstrating that stress causes CVDs to develop in the first place (especially as most people who experience stressors do not develop illnesses at all).

This suggests that stress increases a person's vulnerability to developing CVDs mainly through indirect effects (e.g. lifestyle).

Research support

One strength is research to support the link between stress and CVDs.

Huan Song *et al.* (2019) identified more than 130,000 people with stress-related disorders. Other participants were unaffected siblings of these people and a million people with no stress-related disorders. Compared with controls, people with stress-related disorders had a 64% greater risk of a CVD in the first year after diagnosis.

This shows that exposure to chronic psychological stress can significantly increase CVD risk.

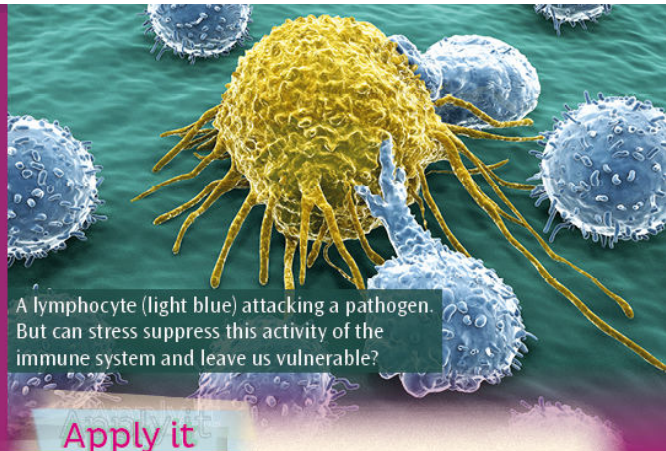
Evaluation eXtra

What's the real cause?

As indicated on this spread, the cause of CVDs could be physiological. There is evidence that stress triggers a physiological response that damages the cardiovascular system (e.g. heart muscle, blood vessels etc.).

However, the cause could be psychological. For instance, our personality influences how we respond to stressors. Some people perceive stressors very negatively and have a strong physiological reaction to them. (Personality and stress is discussed on page 268.)

Consider: *So, what is the real cause of CVDs?*



A lymphocyte (light blue) attacking a pathogen. But can stress suppress this activity of the immune system and leave us vulnerable?

Apply it
Concepts

A chronic stressor

Stefan and Karina have been married for thirty years. Stefan has had Alzheimer's disease for the past three years, and Karina has become his full-time carer. She has noticed that she gets a lot more colds and other minor health issues than she used to. A cut on her hand she got a couple of weeks ago seems to be taking a while to heal.

Question

Use your knowledge of psychological research to explain what is happening to Karina.

Apply it
Methods

Experimental wounding

A psychologist investigated the effects of exam stress on wound healing. She recruited 20 participants by using opportunity sampling. She gave them each a punch biopsy, creating a wound in the roofs of their mouths. She did this on two occasions: one week before the start of an exam period, and one week before the start of the summer holiday. The mean number of days to heal for the 'exam wound' was 10.4. The mean number of days for the 'holiday wound' was 4.1.

Questions

1. Explain how this study could be described as a **field experiment**. (*2 marks*)
2. Write a **directional hypothesis** for this study. (*2 marks*)
3. Outline how the psychologist might have selected an **opportunity sample**. (*2 marks*)
4. Explain *one* **ethical issue** that could arise in this study. (*2 marks*)
5. Explain how the researcher could have dealt with this ethical issue. (*2 marks*)

Check it

1. In relation to the role of stress in illness, explain what is meant by 'immunosuppression'. *[2 marks]*
2. With reference to immunosuppression and cardiovascular disorders, briefly outline the role of stress in illness. *[6 marks]*
3. Explain what research has shown about the role of stress in cardiovascular disorders. *[6 marks]*
4. Describe **and** evaluate research into the role of stress in illness. *[16 marks]*

Sources of stress: Life changes

The specification says...

Sources of stress: life changes.

This spread and the next two focus on *stressors* that arise from various sources in people's lives. On this spread we concentrate on experiences to do with family, relationships, money and personal issues.

How stressful these experiences are depends on how we perceive or interpret them, and on whether we believe we can handle them or not. This is the transactional model of stress.

Key terms

Sources of stress Any feature of the environment that causes stress, including factors associated with work, everyday minor hassles and major changes in our lives.

Life changes Significant and relatively infrequent events in people's lives that cause stress. They are stressful because we have to expend psychological energy coping with changed circumstances.

Apply it

Concepts

Relationship stress

Erika and Elsa have been happily going out with each other for two years. Last month they finally decided to move in together. They thought they would carry on being just as happy, but much to their surprise they now have many more arguments than before. Also, Erika's grandad died two weeks after she moved in with Elsa, and now she has noticed that she isn't sleeping, and gets a lot more headaches than she used to.

Question

Use your knowledge of psychology to explain Erika's experiences. Refer to some psychological research in your explanation.

Study tip

The term 'research' is taken to refer to both theories (explanations) and studies. So either of these can be used when *describing* the content of a topic. On this page we have described a study (Rahe *et al.*).

It may then be confusing that studies on the facing page are used as evaluation – the key is how you *use* the studies. You may use them to explain a topic (description) or may use them to support a critical point (evaluation). When using them for evaluation leave out details of the procedure.

Life changes as a source of stress

What are life changes?

Common **sources of stress** for most people are the big events that take place in our lives, the really important things that happen to us from time to time – you might get married, or divorced, a close relative dies, your financial state changes for better or worse, a new family member arrives. These **life changes** are not everyday events, and they are often major stressors. They are stressful because you have to make a significant psychological adjustment to adapt to changed circumstances. The bigger the change, the greater the adjustment and the associated stress. The effects of life changes are also cumulative – they add together to create more stress because, jointly, they require even more change to adapt. This applies as much to pleasant life changes as it does to negative ones.

Life changes and illness

Life changes are thought to be linked to the onset of illness. To study this, researchers have developed ways of measuring life changes. One of the most commonly used methods is Thomas Holmes and Richard Rahe's (1967) *Social readjustment rating scale* (SRRS), which you can read more about on page 266. It measures stress by assigning a certain number of **life change units** (**LCUs**) to each item on a list. The higher the LCU value, the more adjustment the life change needs, making it more stressful. For example, divorce has 73 LCUs associated with it, marriage has 50, and death of a close friend 37.

Early research using the SRRS was retrospective. Participants ticked off all the life changes they could recall over the previous 12 months. The LCUs for these changes were added up to produce a total score, and this was **correlated** with a measure of the illnesses the participants had experienced over the same period. Rahe (1972) suggested that people scoring under 150 LCUs in a given year were likely to experience reasonable health in the following year. About 50% of people who scored between 150 and 300 LCUs experienced illness the next year. Almost 80% of those who scored over 300 LCUs reported illnesses within the next year.

Rahe *et al.*'s research

A classic study by Rahe *et al.* (1970) used the SRRS in a **prospective** study which aimed to measure life changes and then see who eventually became ill.

Procedure They studied US Navy personnel assigned to three ships (aircraft carriers). The participants completed a version of a scale called the *Schedule of recent experiences* (the forerunner to the SRRS). This covered the six months before a tour of duty. A total LCU score was calculated for each participant for this retrospective six-month period.

Once on board ship for the tour of duty, every illness, no matter how minor, had to be reported to the medical unit. After the ships returned from their missions, an independent researcher reviewed all the medical records and calculated an illness score for each participant. Neither the participants nor the on-board medical staff were aware of the purpose of the study or what the data was being used for.

Findings The researchers found a **significant positive correlation** (of +.118) between the LCU scores for the six months before departure and the scores for illnesses aboard ship. In other words, those who experienced the most stressful life changes in the final six months before leaving on active service, also had the most illnesses in the following six months aboard ship. Rahe *et al.* concluded that life changes were a reasonably robust predictor of later illness.



The life changes approach assumes that happy events can be just as stressful as unpleasant and threatening ones, but is this true?

Evaluation

Research support

One strength of the life changes approach is support from many research studies.

For example, Raija Lietzén *et al.* (2011) used data from the Health and Social Support (HeSSup) study in Finland. They followed over 16,000 adults who did not have asthma at the start of the study. This was a prospective study like the one by Rahe *et al.* (1970, see facing page). The researchers found that a high level of life change stress reliably predicted asthma onset. This link was not explained by other known risk factors such as smoking or having a cat or dog at home.

This study suggests that stressful life changes can contribute to the onset of a chronic illness.

Counterpoint However, there were surprisingly few life changes in the above study. Almost half the participants (48%) experienced either one or no life changes in the five-year study period. This raises the possibility that some other stressful events may have been partly responsible for the asthma onset. Richard Lazarus *et al.* (1980) argue that daily hassles are more important sources of stress than life changes, especially when it comes to effects on health. Hassles are relatively minor but common occurrences (e.g. losing things) that 'build up' and become stressful (see next spread).

Therefore daily hassles may have been better predictors of asthma than life changes for most participants in Lietzén *et al.*'s study.

Individual differences

One limitation is that life changes do not affect everyone in the same ways.

For example, the stress associated with moving house depends on the reasons why the move is necessary (e.g. being worse off or better off financially). This is perceived differently by different individuals. Donald Byrne and Henry Whyte (1980) tried to predict who would experience a myocardial infarction (heart attack) on the basis of SRRS scores. The researchers found that they could only do so if subjective interpretations of life changes were taken into account.

Therefore the life changes approach lacks **validity** because it does not consider individual differences in how life changes are perceived.

Positive and negative changes

Another limitation is that the SRRS muddles together several different types of life changes.

It includes positive and negative changes because it is based on the assumption that all change is stressful. Jay Turner and Blair Wheaton (1995) asked their participants to rate the desirability of selected SRRS items. They found that undesirable or negative life changes caused most stress, not life changes as such. They argued that this might be due to the frustrations associated with negative life changes but not associated with positive events.

This again challenges the validity of the life changes approach because it wrongly assumes that positive and negative life changes have the same effects.

Evaluation eXtra

Issues of causation

The approach on this spread claims that major life changes directly *cause* stress. Any life change requires psychological adjustment. This in turn has direct effects on health and other outcomes. There is evidence to support this view.

However, the relationship may not be causal. Most research on the effect of life changes is correlational (e.g. Rahe *et al.* 1970). Even very strong correlations do not demonstrate a causal relationship. A third unmeasured factor could be responsible for causing both variables (e.g. anxiety).

Consider: *To what extent can life changes explain stress?*



Rahe *et al.* (1970) found evidence of a link between life changes prior to a tour of duty and illness on board US Navy ships like this one.

Apply it Concepts — Perceiving stressors

Bonnie and Sooyoung are friends who recently divorced their husbands. Bonnie seems to have had a new lease of life. She is much happier, and is busily making a new life for herself. Sooyoung feels very differently. She is depressed a lot of the time, and just doesn't seem to be handling her break-up very well at all.

Question

Use what you know about life changes to explain Bonnie's and Sooyoung's very different experiences.

Apply it Methods — A quasi-experiment

A psychologist wanted to see if there is a gender difference in number of life changes people experience. Ten women and ten men completed the SRRS, by indicating which life changes they had experienced over the previous six months. Responses were added up to produce an overall Life Change Unit (LCU) score for each participant.

Questions

1. Explain why the research method used in this study might be classed as a **quasi-experiment**. (*2 marks*)
2. Explain *one* strength and *one* limitation of this research method. (*2 marks + 2 marks*)
3. The psychologist decided that the SRRS was unsuitable for further research, so she devised her own scale. Explain how she could have checked the **validity** of her scale. (*3 marks*)
4. Explain *one* way in which **investigator effects** could have influenced the outcome of this study. (*2 marks*)

Check it

1. Explain what is meant by 'life changes'. *[2 marks]*
2. Explain what research has shown about life changes as a source of stress. *[6 marks]*
3. Evaluate research (theories and/or studies) into life changes as a source of stress. *[6 marks]*
4. Describe **and** evaluate research into life changes as a source of stress. *[16 marks]*

Sources of stress: Daily hassles

The specification says...

Sources of stress: daily hassles.

We saw on the last spread that major events in our lives can present very significant challenges that cause a lot of stress when they happen. But ordinary day-to-day life has its own ways of tripping us up with unremarkable trifling events that we don't even consider 'proper' stressors. Psychologists have wondered whether such trifling events may be more significant than life changes in explaining how stress affects our health.

Key term

Daily hassles The relatively minor but frequent aggravations and annoyances of everyday life that combine to cause us stress, such as forgetting where you have put things and niggling squabbles with other people.

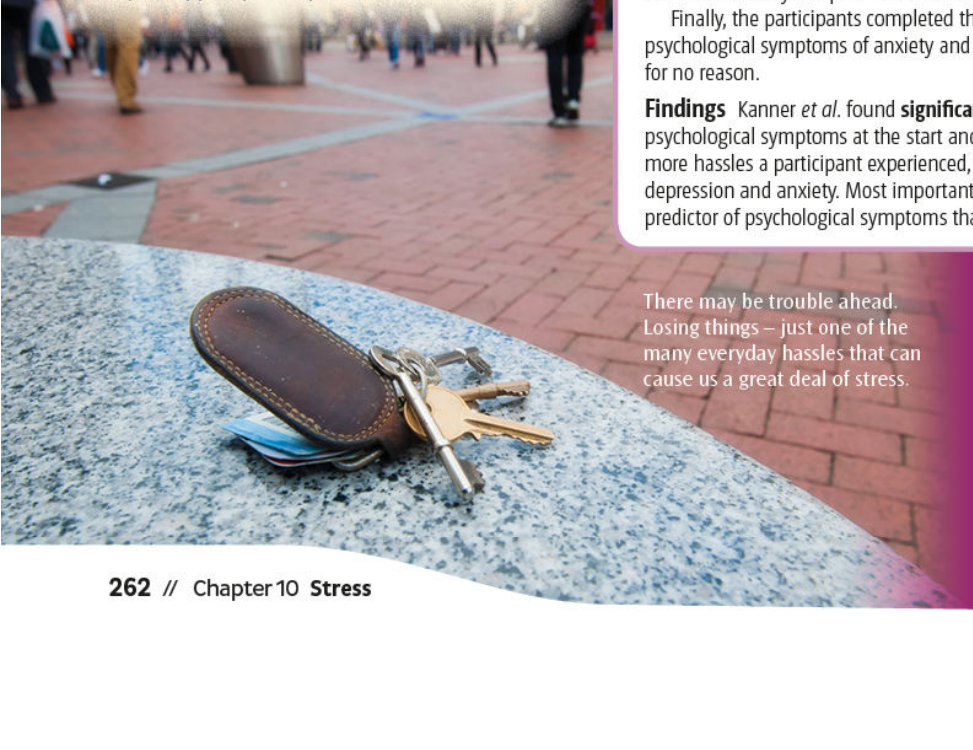
Apply it
Concepts

Anita's everyday hassles

Anita had always been a healthy person and was very rarely ill. But six months ago she started getting a lot more colds and niggling headaches and muscle pains than usual. She went to see her doctor, who said that her blood pressure was too high and she would need to start taking medication. Anita wondered why she was feeling so run down, so she started keeping a diary. She noticed that her symptoms often coincided with times when she seemed to be losing things a lot, getting frustrated in traffic, and just generally having too much to do.

Question

How would you explain what is happening to Anita? Use at least *one* psychological research study to support your explanation.



There may be trouble ahead. Losing things – just one of the many everyday hassles that can cause us a great deal of stress.

Daily hassles as a source of stress

What are daily hassles?

Richard Lazarus and his colleagues (1980) questioned whether **stress** is best characterised by the big **life changes** that by definition happen to us only infrequently and often unpredictably. Lazarus *et al.* suggested that looking at **daily hassles** instead could give us a better understanding of how stress can make us ill.

Daily hassles are those frequent and everyday irritations and frustrations that seem to get on top of us. They range from minor and even trivial inconveniences to greater pressures and difficulties, although not approaching the significance of a major life change. We can't find our keys, we've just got too much to do and not enough time, we're worried about that argument we had with a friend, and somehow we have to fit in the shopping because it's our turn to cook the tea. Oh, and the washing machine's broken. Nothing major happened, but the added effects of all those hassles leave us feeling stressed.

Primary and secondary appraisal

Lazarus *et al.* argued that when we experience a hassle we first engage in *primary appraisal*. We work out subjectively how threatening it is to our psychological health. If we deem it threatening we then move on to *secondary appraisal* – we subjectively consider how well equipped we are to cope with the hassle. So the theory of daily hassles has built into it the importance of *psychological* appraisal or interpretation of the meaning of hassles to individuals.

Hassles, uplifts and life changes

Hassles and uplifts are measured using the **Hassles and uplifts scale** (HSUP, Kanner *et al.* 1981). This self-report measure assesses how many hassles a person experiences in a defined period and how severe the hassles are (e.g. losing things, lack of time). Uplifts are daily enjoyable things that give us a small 'boost' and offset the stress of hassles (e.g. getting on with friends). See page 266 for more details.

Life changes exert their effects on well-being through daily hassles. Major changes such as a serious illness severely disrupt the normal everyday routines that we are used to. So life changes have indirect effects – they are *distal* sources of stress. But daily hassles are *proximal* sources of stress because their effects are direct and immediate.

Kanner *et al.*'s research

Allen Kanner *et al.* (1981) researched the question of whether daily hassles were a better predictor of psychological ill-health than life changes.

Procedure They constructed a *Hassles scale* which 100 participants (aged 45 to 64 years) completed every month for nine consecutive months. The Hassles scale uses a checklist to measure 117 hassles in terms of how often they occur, and how severe they are.

The participants also completed a scale to measure life changes on two occasions. The first occasion was one month before the study began. For this, the participants were asked to think back two-and-a-half years and rate life changes during this time. The second occasion was during the tenth month of the study. This meant the researchers had two measures of life changes: for the two-and-a-half years prior to the start of the study and for the ten months of the study.

Finally, the participants completed the *Hopkins symptom checklist*, a scale to measure psychological symptoms of anxiety and **depression**, such as feeling lonely and worthless and crying for no reason.

Findings Kanner *et al.* found **significant positive correlations** between hassle frequency and psychological symptoms at the start and the end of the study, for both men and women. So the more hassles a participant experienced, the more severe were their psychological symptoms of depression and anxiety. Most importantly, again for both men and women, hassles were a stronger predictor of psychological symptoms than life changes.

Study tip

It's always helpful to use examples for illustration. There are lots of possibilities for daily hassles so make sure you're familiar with a few of them and use them to elaborate on a definition or to clarify an explanation. You can even contrast hassles with life changes. But make sure you don't muddle hassles with life changes.

Practical activity on page 282

Evaluation

Research support

One strength is evidence that daily hassles have significant effects on health and behaviour.

John Ivancevich (1986) asked participants to complete the HSUP. Measures of general health, job performance and work absenteeism were also taken. Ivancevich found that daily hassles (plus uplifts) were strong predictors of poor health, poor job performance and absenteeism from work. In terms of work-related stress it seems that minor day-in day-out stressors can accumulate and have significant effects.

This suggests that daily hassles are a valid explanation of stress experienced by many people.

Counterpoint However, Ivancevich's study (like most research into daily hassles) depends on retrospective self-report. His participants had to recall the daily hassles and life changes they experienced over the previous month. The usefulness of the data depends on how accurate the participants' memories are. But this is an especially problematic issue for research into daily hassles (e.g. losing keys or filling out an annoying form). This is because hassles are by definition minor happenings and so are much easier to forget than major life changes.

This means the **validity** of hassles research may be doubtful.

Individual differences

Another strength is that the daily hassles approach explains differences between people.

People differ in their understanding of what constitutes a hassle. As Lazarus *et al.* point out (see facing page), this is because the stress of a daily hassle depends on how we interpret it. Take the example of losing keys. One person perceives this hassle as a disaster ('Someone will rob my house') but another does not. This is primary appraisal. One person believes they can cope ('I'll change the lock') but another does not. This is secondary appraisal.

Therefore the daily hassles approach can explain individual differences in how stress affects our health and behaviour.

Correlation not causation

One limitation is that hassles research is mostly correlational.

Studies have consistently shown significant correlations between hassles and stress. But as we saw with life changes on the previous spread, even the strongest correlation does not demonstrate causation. We cannot necessarily conclude that daily hassles cause stress. This is because another (unmeasured) factor may be causal. For instance, depression may cause people to experience daily hassles more intensely and at the same time cause them to feel stressed. So hassles and stress only appear to be linked.

This suggests the link between hassles and stress may be indirect and depends on other factors.

Evaluation eXtra

Hassles versus life changes

Daily hassles are stressful because we experience a lot of them in a typical week and their effects are cumulative. Also, hassles can make life changes seem worse.

However, as we saw on the previous spread, it is possible that life changes are more stressful because they are major events that have powerful effects on most people. Someone experiencing a life change will probably encounter more daily hassles than usual.

Consider: *Which is most stressful – life changes or daily hassles?*

☐ YES

☐ NO

☐ MAYBE



A real problem for research. Sometimes it can be quite difficult to remember accurately which hassles we've experienced, even at the end of the same day.

Apply it Concepts — Hassles and life changes

Avron and Heidi were waiting for a bus when they got talking about their lives. Avron explained how he was quite lonely because he doesn't see many people, and his kids live too far away. Heidi said she had recently got divorced just a couple of months after she retired.

Question

Use Avron and Heidi's experiences to explain some of the differences between daily hassles and life changes.

Apply it Methods — Hassles and illness

A researcher wanted to see whether daily hassles or life changes were the better predictors of ill health. 50 volunteer participants downloaded a mobile app which prompted them to complete the Hassles and uplifts scale and the Social readjustment rating scale. The prompt was sent out every few days over a one-month period. The participants also rated the severity of illnesses experienced each time. Median scores for hassles, life changes and illness severity were calculated.

Questions

1. How might the researcher choose a **volunteer sample** for this study? (*2 marks*)
2. Explain why the researcher calculated **medians** for hassles, life changes and illness severity. (*2 marks*)
3. Explain how **demand characteristics** could have affected the outcome of this study. (*2 marks*)
4. The researcher was concerned that the assessment of illness severity was not reliable. Explain *one* way in which this could be true, and *one* way in which **reliability** could have been improved. (*2 marks + 2 marks*)
5. The researcher gained **primary data** from this study. Briefly outline *one* difference between primary and **secondary data**. (*2 marks*)

Check it

1. Explain what is meant by 'daily hassles'. *[2 marks]*
2. Explain what research has shown about daily hassles as a source of stress. *[4 marks]*
3. Give **one** example of a daily hassle and explain why this might be a source of stress. *[3 marks]*
4. Discuss research into daily hassles as a source of stress. *[16 marks]*

Sources of stress: Workplace stress

The specification says...

Sources of stress: workplace stress, including the effects of workload and control.

A Health and Safety Executive (HSE) report (2019) revealed that more than 600,000 people in the UK experience workplace stress to a degree that is making them ill. Millions more work in jobs that they rate as 'very' or 'extremely' stressful. The costs to individuals and to society are enormous. The HSE calculates that work-related stress costs the UK economy over £5 billion every year.

Because of these high human and financial costs, psychologists are urgently trying to answer the question of what causes stress in the workplace.

Key terms

Workplace stress Sources of stress that people experience in relation to their job.

Workload The amount of time/effort required in a job. Can refer to underload as well as overload, but is usually taken to mean the latter.

Control The degree of freedom a worker has to perform their job how they wish. Often defined in terms of the autonomy they have to make decisions.

Having too much work to do is one of the biggest workplace stressors for most people in most cultures.



Research into workplace stress

Researchers have identified several factors in the workplace that create **stress** and may contribute to physical, psychological and behavioural symptoms of illness. Two factors which have attracted a great deal of research attention are **workload** and **control**.

Job demands-control model

These two major stressors are linked by Robert Karasek's (1979) *job demands-control model* of **workplace stress**. The model states that the stressful demands of a job, such as work overload, can lead to poor health, dissatisfaction, and absenteeism. But this relationship can be modified by the amount of control the employee has over their work. So when two people have equally demanding jobs (because the workload is too great) only the one who lacks control becomes ill. Having job control acts as a *buffer* against the negative effects of job demands.

Bosma *et al.*'s research

Hans Bosma *et al.* (1997) carried out a **prospective** study of over 10,000 civil servants in a wide range of job grades.

Procedure The study used a detailed **questionnaire** to measure various aspects of workload and job control. Participants were also examined for symptoms of coronary heart disease (CHD) and followed up after five years.

Findings The researchers found no **correlation** between workload and illness, so job demands were not a significant workplace stressor.

However, those employees who reported having a low degree of control at the start of the study were more likely to have CHD five years later, even when other risk factors (lifestyle, smoking, diet) were statistically accounted for. This was true across all job grades. So the status and the support given to higher grade civil servants did not offset the risk of developing CHD, if their jobs lacked control. A later analysis (Bosma *et al.* 1998) confirmed that this relationship was not affected by individual differences in personality (such as anger and competitiveness), or by coping skills.

Johansson *et al.*'s research

Procedure Gunn Johansson *et al.* (1978) carried out a **natural experiment** comparing two very different groups of workers in a Swedish sawmill. One group consisted of 14 wood 'finishers', whose job was to prepare the timber. The job was repetitive and the finishers were cut off from the other workers. Because work was set by the machine these employees had little control. Yet the job was demanding because it was complex, skilled and carried a lot of responsibility. The wages of everyone else on the production line depended on the finishers' productivity. The second group consisted of cleaners. They had more control, greater flexibility, more contact with other workers and much less responsibility.

The researchers measured levels of employee illness and absenteeism from personnel records. They also measured levels of the stress hormones **adrenaline** and **noradrenaline** in the workers' urine, once before leaving home in the morning and then at work three times a day.

Findings There was a higher level of stress hormones in the finishers group overall. The first hormone samples taken each day showed they already had higher hormone levels than the cleaners, even before they got to work. Also, the finishers' hormone levels increased over the day, but the cleaners' levels decreased. Finally, there were more stress-related illnesses among the finishers and absenteeism was higher.

As the job demands-control model indicates, these findings suggest that both demands (overload) and lack of control create chronic physiological arousal (even when resting). This in turn leads to the production of stress hormones and the development of stress-related illnesses.

Apply it Concepts

Stress at work

Priti and Cary were talking about their jobs recently. Priti explained how her company had been through a big restructuring. Several people left and weren't replaced, but everyone else was still expected to get the work done. There are now some parts of her job she can't do until other people have done their bit, and her pay depends on how well they all do. Priti has been off work ill twice in the past month, and she is worried about her health. Cary feels sorry for her, because nothing has changed in his job and he hasn't had a day off ill for years.

Question

Use your knowledge of workplace stress to explain how Priti has been affected by the restructuring. Refer to **at least two** stressors, and to psychological research.

Evaluation

Cultural similarities

One strength is that workload as a source of stress is a culturally generalisable concept.

Cong Liu *et al.* (2007) investigated perceptions of job stress in China (mostly a **collectivist** culture) and the US (mostly an **individualist** culture). They used a **qualitative** method by asking workers to describe stressful events at work over the previous month. There were differences between the Chinese and US workers in their perceptions of several work-related stressors, but not for workload – it was rated as the third most stressful workplace stressor in both cultures.

This suggests that workload is understood as stressful in very different cultures and can therefore be generalised.

Counterpoint However, not all workplace stress concepts are recognised across cultures.

Christina Györkös *et al.* (2012) reviewed cross-cultural studies of job control. Lack of control was seen as much more stressful in individualist cultures (UK and US) than in collectivist cultures (China and other Asian countries). In fact, the whole concept of job control may reflect individualist ideals such as personal rights. It may not generalise to collectivist cultures which prioritise the good of the wider group, community and society.

This and the previous point show that 'workplace stress' has many aspects, not all of them **generalisable** across cultures.

Simplistic model

One limitation of the job demands-control model is that it does not take account of the range of workplace stressors.

Lack of control and workload are significant stressors for many workers (at least in some cultures). But they are not the only ones. The stress a worker experiences depends on a complex interaction between various other factors, e.g. the kind of work and how well they use coping mechanisms. Also, the key issue is not the actual amount of control/support or workload an employee has but their *perception* of how much they have.

The job demands-control model lacks **validity** because of its simplistic focus on just two major workplace stressors.

Control may be stressful

Another limitation is that having job control may be more stressful than not having it.

It depends on **self-efficacy**, the degree to which someone believes they are able to perform tasks successfully. Laurenz Meier *et al.* (2008) found that employees with a low sense of self-efficacy reported feeling stressed in jobs that gave them more control. The reverse was true for employees with high self-efficacy – low control was more stressful. Having job control means being able to make decisions, for example. People with low self-efficacy find this difficult, so control becomes another stressor in addition to the others they face in the workplace.

This shows that job control is not stressful in itself but depends on individual differences such as self-efficacy.

Evaluation eXtra

Validity

Many studies of workplace stress are conducted in workplace environments rather than labs (e.g. Johansson *et al.*). They tend to have high **external validity** which makes findings generalisable to real-world workplaces.

However, such studies tend to be natural experiments in which job roles are already assigned. This means employees could differ systematically in ways that affected the outcome. So uncontrolled **confounding variables** reduce a study's **internal validity**.

Consider: *How valid are studies conducted in real-world workplaces?*



Out of control? A lack of control over your job is stressful for many people, but not for all.

Apply it Concepts — Reducing stress

Peggy runs her own business and employs ten people. She thinks of herself as an enlightened employer and wants to keep her workers happy and as stress-free as possible. She is prepared to make any changes necessary to her employees' jobs, within reason.

Question

Imagine Peggy is a friend of yours who knows that you have been studying workplace stressors. What advice would you give her, based on psychological research?

Apply it Methods — A stress diary

Two psychologists recruited 100 employees for a study of workplace stressors. They asked their participants to keep a daily diary of their stressful experiences at work over a one-month period. The researchers used content analysis to analyse the data from the diaries.

They found that 35% of the entries related to a lack of control over the job, 10% to problems with colleagues, 25% to having too much work to do, 15% to poor environmental conditions such as noise, 10% to not understanding their role clearly and 5% of entries could not be categorised.

Questions

1. Explain how the psychologists could have carried out their **content analysis**. (*4 marks*)
2. The study gathered a lot of **qualitative data**. Explain what is meant by qualitative data. (*2 marks*)
3. Outline *one* strength of gathering qualitative data in this study. (*2 marks*)
4. What is meant by the term **reliability**? (*1 mark*)
5. Explain how the two psychologists could have established the reliability of their content analysis. (*3 marks*)

Check it

1. In relation to workplace stress, explain what is meant by 'workload' **and** 'control'. *[2 marks + 2 marks]*
2. Outline research into workplace stress. *[6 marks]*
3. Briefly outline the effects of workload **and** control on workplace stress. *[3 marks + 3 marks]*
4. Discuss research into the effects of workload **and** control on workplace stress. *[16 marks]*

Measuring stress

The specification says...

Measuring stress: self-report scales (Social readjustment rating scale and Hassles and uplifts scale) and physiological measures including skin conductance response.

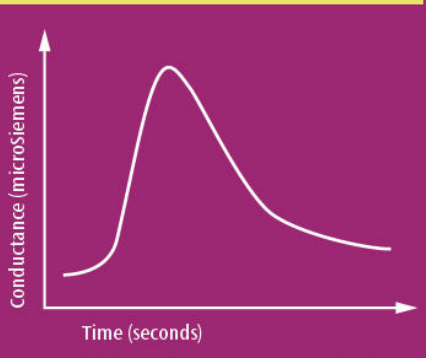
Psychologists are very keen to understand the ways in which stress can make us ill. There are very significant real-life benefits to be had from understanding this relationship. But before psychologists can get to this point, they need reliable and valid ways of measuring stress. Two broad categories of measurement have been developed: self-report and physiological methods.

Key terms

Social readjustment rating scale (SRRS) A self-report checklist measure of the stress associated with 43 life changes. Each one is linked with a number of life change units (LCUs) reflecting the degree of readjustment needed to cope with the change (e.g. 'Divorce' is 73 LCUs).

Hassles and uplifts scale (HSUP) A self-report measure of the stress associated with everyday irritations (hassles) and of the small pleasures of daily life that are thought to partly offset the negative effects of hassles (uplifts).

Skin conductance response (SCR) A physiological measure of sweating which is related to arousal of the autonomic nervous system. ANS arousal activates the body's fight or flight response when a stressor occurs. Small increases in sweating can be detected as greater electrical conductance across the skin.



A typical skin conductance response (SCR), a slope at the start indicating the onset of the response, which takes time to rise, reaches a peak and then decays in a long 'tail' on the trace, all within four or five seconds.

Self-report measures of stress

Social readjustment rating scale

The **Social readjustment rating scale** (SRRS) is a **self-report** method of measuring **life changes** in relation to **stress** (see page 260), developed by Thomas Holmes and Richard Rahe (1967). They studied the medical records of thousands of hospital patients, identifying the events in the patients' lives before they became ill. The SRRS presents a list of 43 of these life changes.

Not all of the events were equally stressful, because they didn't require the same degree of adjustment to adapt to them. Therefore Holmes and Rahe attached a value to each life change to reflect the degree of adjustment needed. They worked out the values by asking several hundred participants to rate each item in these terms: 'How much readjustment do you think would be needed to adapt to each of these life changes on a scale of 1 to 1000 units?' As a guide, the raters had to imagine that marriage was 500 units of life change.

The researchers calculated **means** for each item and divided these figures by ten. This created a **life change unit** (**LCU**) score for each change. The changes were then put in rank order from highest LCU score to lowest (see examples on right).

Participants complete the SRRS by indicating which life changes they have experienced over a period of time, typically 12 months. The LCUs for these items are added to give an overall score.

Examples from the SRRS.

Rank	Life event	LCUs
1	Death of spouse	100
2	Divorce	73
3	Marital separation	65
6	Personal injury or illness	50
7	Marriage	50
12	Pregnancy	40
17	Death of close friend	37
25	Outstanding personal achievement	28
30	Trouble with boss	23
35	Change in church activities	19
42	Christmas	12

Hassles and uplifts scale

Allen Kanner *et al.* (1981) proposed that the combined effects of daily hassles and uplifts are more useful indicators of stress (see page 262), measured with the **Hassles and uplifts scale** (HSUP). The Hassles scale consists of 117 items in seven categories: work, health, family, friends, environment, practical considerations and chance occurrences. Examples of hassles include troublesome neighbours, too much responsibility, disliking work colleagues and planning meals. Severity is measured on a three-point scale: somewhat, moderately or extremely severe. The severity measure reflects the fact that the psychological meaning of each hassle to the individual is more important than how often it happens.

The Uplifts scale was constructed by a similar process: 135 items were produced from the same content areas. Examples of uplifts include getting enough sleep, liking fellow workers, relating well with friends and meeting responsibilities. The individual identifies all of the uplifts that apply and then indicates how often they have experienced them over a specified time period (e.g. that day).

Physiological measures of stress

Skin conductance response

The rationale behind using skin conductance is based on the **fight or flight response**. When we experience stress, the **autonomic nervous system** is aroused and one of the consequences is that we sweat more. The most sensitive (and practical) part of the body where this can be detected is the hand. Electrodes are attached to the index and middle fingers of one hand. An electric current is used but it is so weak it can't be felt. This is applied to the electrodes to measure how much electricity is being conducted. Human skin is a good conductor, so the more we sweat, the more conductance there is. This can be measured in microSiemens, the signal amplified and displayed on a screen.

There are two types of skin conductance. *Tonic conductance* is when we are not experiencing a stimulus. It is used as a baseline measure against which to compare *phasic conductance*. This type occurs when something happens, for example you are shown an image or someone asks you a question. The response is called a **skin conductance response** (SCR) and it follows a typical pattern (see diagram on left). The whole response can take four or five seconds. Along with measures of heart rate, respiration and blood pressure, the SCR makes up a *polygraph*, more commonly known as the 'lie detector test'.

Other physiological measures

Blood pressure is known to increase during stressful experiences (positive and negative). For example, the well-known 'white coat syndrome' occurs when your blood pressure increases because you know it is being measured!

Adrenaline and cortisol are 'biomarkers' of acute and chronic stress respectively. Both can be measured in urine and blood, but cortisol can also be measured in saliva. Saliva collection is quicker and easier especially when a researcher wants to track levels throughout a day. Cortisol and adrenaline levels vary naturally in a cycle during the day, so baseline measures also have to be taken in periods of low/no stress for comparison.

Evaluation

Validity of self-report

One strength of self-report measures is that they are a **valid** way of measuring stress.

Stress is a personal experience and therefore the best way to understand it is to ask people about it. Self-report (i.e. by questionnaire or interview) is the most direct way of doing this. It is also an acceptable way – asking questions about a person's experiences 'makes sense' to most people as a way of measuring stress. This means they are likely to respond with as much insight and honesty as they can manage.

Therefore the findings of studies based on self-report measures can be judged as fairly true reflections of the stress participants feel.

Counterpoint Many items on these measures are more like general categories than individual events. This allows the items to be interpreted in different ways by different people. Bruce Dohrenwend *et al.* (1990) asked participants what they thought the items meant. For example, the interpretation of 'Serious illness and injury' ranged from 'sprained arm' to 'a life-threatening heart attack'. These varying interpretations affect research findings because people who experience the greatest stress when they complete the measure may also put the most negative interpretations on the items.

This means there is a 'built-in' bias that inflates stress scores and reduces the validity of self-report measures.

The contamination effect

One limitation of self-report scales is that they mix together the causes and effects of stress.

The SRRS and HSUP Scale are meant to predict stress-related illness. But many items (causes of stress) overlap with symptoms of illness (effects of stress). For example, 'Personal injury or illness' is included as a source of stress on the SRRS. This is like saying, 'You are likely to have a stress-related illness because you are experiencing a personal injury or illness'. In reality these scales *reflect* illness rather than *predict* it.

This is why some psychologists argue that self-report measures should be abandoned and replaced by direct observations of behaviour.

Evaluation eXtra

Subjective versus objective

Self-report measures are subjective in that they assess participants' perceptions of stressors. This means self-reports are prone to biases such as **social desirability**. But stress is deeply subjective so the best source of information is the people experiencing it.

Physiological measures are objective because they measure verifiable biological features of stress. But there is no unique link between physiological states and stress – people respond in similar ways to very different experiences.

Consider: *Which is the most valid measure of stress?*

Evaluation

Individual differences

One limitation is that people differ systematically in their SCRs.

SCR measurement does recognise that people have different patterns of skin conductance, which is why a baseline measure is always taken. But additionally, people can be divided into two groups based on their SCRs. Some people are *stabiles* whose SCRs vary little when they are at rest and are not much influenced by internal thoughts or external events. In contrast *labiles* produce a lot of SCRs even when they are at rest. Many research studies do not take this difference into account.

Therefore SCR measurement is not a straightforward matter of comparing baseline (tonic) SCRs against stimulated (phasic) SCRs.

Scientific measures

One strength of physiological measures is that they are not affected by personal biases.

Skin conductance, blood pressure and hormone secretion are all reliably associated with experiences of stress. Researchers need to take into account that these indicators all have a 'baseline' which varies from person to person. But as long as this is done then physiological measures are free of the biases that undermine self-reports. For example, cortisol levels are not affected by social desirability in the way that completing a questionnaire often is.

This means that physiological measures are considered more scientific measures of the body's physiological stress response.



Self-report questionnaires are a common method of measuring stress, because it makes sense to ask people directly about their stressful experiences.

Apply it Concepts

Measuring stress at work

As part of her efforts to keep her workforce as stress-free as possible, Peggy has asked you to measure her employees' stress levels. However, she's not sure how this is done, although she has heard that there are different methods available.

Question

Imagine you have to explain stress measurement methods to Peggy. Give a brief explanation of each one, and indicate what limitations they might have for her measurement needs.

Apply it Methods

Measuring SCRs

A researcher wanted to measure the stress caused by watching a video of students taking an exam. He chose a physiological indicator of stress – the skin conductance response (SCR). He recruited ten participants from a local sixth-form college. He measured each participant's total number of SCRs in a five-minute period, once when at rest (tonic), and again when they were watching the video (phasic).

Questions

1. The psychologist realised that he would need to use **counterbalancing**. Explain how he could have done so and why it was necessary. (*2 marks + 2 marks*)
2. The psychologist wanted to calculate a **measure of central tendency**. Identify the appropriate one to use and explain why. (*1 mark + 2 marks*)
3. The psychologist decided to analyse the difference between the number of SCRs measured at rest and when watching the video. Which **statistical test** would be appropriate to use? Give *two* reasons for your answer. (*1 mark + 2 marks*)
4. The result of the test turned out to be **significant**. Explain what this means. (*2 marks*)

Check it

1. In relation to measuring stress, explain what is meant by 'skin conductance response'. *[2 marks]*
2. Briefly outline **one** self-report scale used to measure stress. *[4 marks]*
3. Explain **one** limitation of the Social readjustment rating scale. *[3 marks]*
4. Describe **and** evaluate methods of measuring stress. *[16 marks]*

Individual differences in stress: Personality type

The specification says...

Individual differences in stress: personality types A, B and C and associated behaviours.

Psychologists have been interested in possible links between personality and the experience of stress. They have asked, 'Can your personality influence whether or not you become ill as a result of stress?' In slightly more technical terms, is personality a *moderator* of the effects of stress on illness?

Several aspects of personality have been proposed as important moderators of the stress–illness relationship. But a significant focus of research has been on the personality types called Type A, Type B and Type C. Of these, Type A has attracted the most interest.

Key terms

Type A personality Describes someone who is competitive, time-urgent (e.g. impatient) and hostile in most situations. Research has linked this personality type to coronary heart disease (CHD).

Type B personality Describes someone who is laid-back, relaxed and tolerant of others in most situations (i.e. the opposite of Type A).

Type C personality Describes someone who is compliant, avoids conflict and suppresses their emotions, especially anger, in most situations. Some research has linked Type C with cancer.



People who always try to avoid conflict might do so by suppressing their own emotions, with negative consequences for their health.

Apply it Concepts — Footballing personalities

Meyer, Helen and Ted are three friends who play for the same football team on Sunday mornings. Meyer has always been competitive and gets very impatient when he thinks the others aren't putting in the effort. He also gets irritated and angry when the team doesn't win. Helen is completely different – she enjoys playing, but she doesn't take it too seriously and likes to have a laugh more than anything else. But this attitude annoys Meyer and when he and Helen argue, Ted has to step in and be the peacemaker. Ted goes out of his way to please everyone, because he hates conflict. He just wishes everyone would agree with each other.

Question

What personality types are Meyer, Helen and Ted? Explain how each one is likely to respond in stressful situations.

Stress and personality

Type A and B personality

The scientific interest in the links between personality, **stress** and illness began in the 1950s with two cardiologists, Meyer Friedman and Ray Rosenman (1959). They treated patients with **coronary heart disease** (CHD) and came to believe that CHD might be associated with a certain pattern of behaviour – what they called **Type A personality**. Friedman (1996) later described people with a Type A personality as having high levels of:

- *Competitiveness* – they are achievement-motivated, ambitious, aware of their own and other people's status, and view life in terms of challenges, goals and targets.
- *Time urgency* – Type As are fast-talking, impatient, proactive, see creative pursuits as a waste of time and prefer to multi-task.
- *Hostility* – they are aggressive, intolerant, inflexible and quick to anger.

Friedman and Rosenman also identified the characteristics of **Type B personality**, which contrast in every way with Type A. People who are Type B are more relaxed, tolerant, reflective, 'laid back' and less competitive than Type As.

Friedman and Rosenman's research

The Western collaborative group study (WCGS) was Friedman and Rosenman's **prospective** study of over 3000 men living in California.

Procedure The men were all medically assessed as free of CHD at the start of the study. Personality type was assessed by 25 questions in a **structured interview**. The questions concerned their responses to everyday irritations, such as having to wait in queues. The interviews were conducted in a way designed to incite Type A-related behaviour in the participants. For example, the interviewer would be aggressive and frequently interrupt. Behaviour (such as speed of talking) was observed so the researchers classified participants as Type A or Type B.

Findings Eight-and-a-half years later (Friedman and Rosenman 1974), 257 men had developed CHD. 70% of them had been assessed at the start of the study as Type A. This was almost twice as many as the Type Bs who developed CHD, even when known CHD risk factors were accounted for. Type As had higher levels of the stress hormones **adrenaline** and **noradrenaline** and higher blood pressure and cholesterol levels. This suggests that Type A people are vulnerable to stressors. Their impatience and hostility cause a raised physiological stress response, which in turn makes them prone to CHD.

Type C personality

A third personality type, **Type C**, was proposed to be linked with cancer by Lydia Temoshok (1987). Type C people have been described as manifesting *pathological niceness*. Because they are 'people pleasers', they strive to be compliant, extremely patient, passive and self-sacrificing. However, because they wish above all else to avoid conflict, Type Cs frequently achieve this by **repressing** their emotions, including anger. It is this behaviour that is thought to be especially relevant to cancer-proneness.

Dattore *et al.*'s research

Procedure Patrick Dattore *et al.* (1980) studied 200 veterans of the Vietnam War, 75 of them were cancer patients and the rest formed a **control group** of people with non-cancer diagnoses. They had all completed scales to measure repression of emotions and symptoms of depression several years before they were diagnosed. So this was again a prospective study.

Findings The researchers found the cancer patients reported **significantly** greater emotional repression and fewer depression symptoms than the non-cancer controls. The finding related to depression may appear surprising, but it supports the view that people who repress their emotions (especially negative ones) are unlikely to acknowledge they are depressed. This is evidence of a link between Type C and cancer-proneness.

Evaluation

Real-world application

One strength of Type A/B research is that it can improve health-related outcomes.

For example, David Ragland and Richard Brand (1988) followed up men from the original WCGS who survived a heart attack. Over several years, the death rate for Type B survivors was significantly higher than for Type A survivors. One explanation for this unexpected outcome may be that Type As were more likely than Type Bs to change their behaviour after surviving a first heart attack. They may have behaved more healthily than Type Bs, including modifying their Type A behaviours and avoiding stress.

Therefore data from research can be useful in convincing Type A individuals to change their behaviour and thus live longer.

Counterpoint However, the participants in the WCGS were all men, including those in Ragland and Brand's follow-up. So some of our knowledge of the role of personality is based on how men respond to stress. This knowledge may be less relevant to women. This is a form of gender bias sometimes called **beta bias** – findings from studies into males are applied to females without further testing. It means that practical advice about surviving CVDs that may work well for men may not necessarily work for women.

Therefore, research into Type A/B may be gender-biased as some of our knowledge is based on male participants only.

Problems with Type A concept

One limitation is that the traditional Type A personality concept is much too broad.

Type A encompasses too many different traits. Researchers eventually focused on the hostility component of Type A to explain the link between stress and CHD. Hostile people are cynical, selfish, manipulative, mistrusting and openly contemptuous. Dorit Carmelli *et al.* (1991) analysed 27-year follow-up data from the WCGS. They found exceptionally high CHD-related death rates in a subgroup of men with high hostility scores.

Therefore, it looks like it is not the broad Type A personality that is linked to illness but the narrower hostility component.

Contradictory Type C evidence

Another limitation is evidence that challenges the role of Type C in cancer.

Steven Greer and Tina Morris (1975) found a link between breast cancer and the emotional suppression typical of Type C. This finding was in line with the personality theory of stress and cancer. However, the link only existed in women under the age of 50. In general, research into the links between Type C and cancer is plagued by inconsistent findings.

This suggests that the role of personality in cancer is not straightforward and is moderated by age and probably other biological factors.

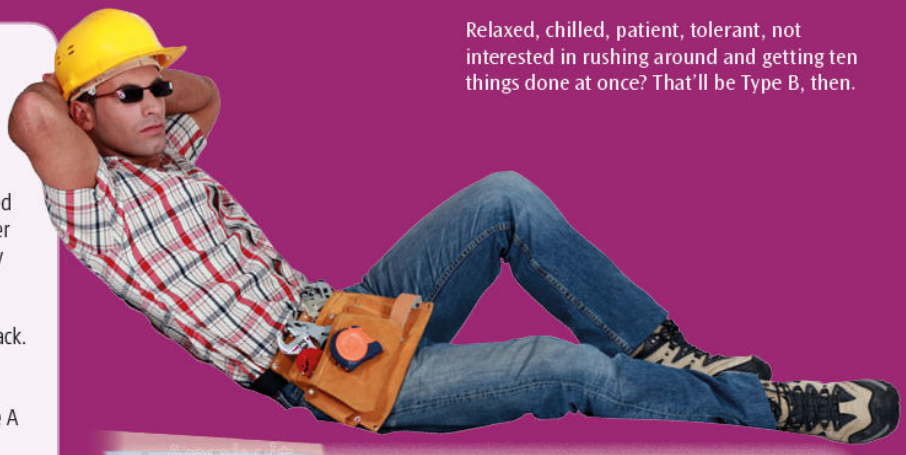
Evaluation eXtra

Type A and Type B

Evidence on this spread suggests that there are two distinct personality types (A and B) that respond to stress differently. Type As are more likely to deal with stress in a way that harms their health.

However, other evidence shows that the Type A stress–illness link is weak and correlational. Such inconsistent and contradictory findings suggest that the distinction between Type A and Type B is blurred.

Consider: *Is Type A personality still a useful concept?*



Relaxed, chilled, patient, tolerant, not interested in rushing around and getting ten things done at once? That'll be Type B, then.

Apply it Concepts — Changing Type A

Malaya was told recently that she is a Type A kind of person. She is now worried that she might be vulnerable to developing heart disease because she read that there could be a link between the illness and Type A personality. She wants to know how she could change her behaviour to reduce her risk.

Question

What advice would you give Malaya? How is she likely to behave at the moment and what does she need to do to change?

Apply it Methods — Observing Type C

In a study by Eveline Bleiker *et al.* (1996), more than 9000 women completed a detailed questionnaire to assess various personality characteristics. These included one closely associated with Type C: anti-emotionality, which involves an absence of emotional expression. Over the next five years, 131 of the women in the study were diagnosed with breast cancer. The study also included a matched control group of women without cancer.

The researchers found that anti-emotionality was the only personality characteristic that differed significantly between the two groups, with the women diagnosed with breast cancer scoring significantly higher on average.

Questions

1. Explain why this study could be described as **longitudinal**. (*2 marks*)
2. Explain *one* possible **confounding variable** in this study. (*2 marks*)
3. Briefly outline *one* difference between a **population** and a **sample**. (*2 marks*)
4. Outline *one* method the researchers could have used to recruit participants for this study. (*2 marks*)
5. Explain *one* strength and *one* limitation of using a **questionnaire** in this study. (*2 marks + 2 marks*)

Check it

1. In relation to individual differences in stress, explain what is meant by 'Type C personality'. *[2 marks]*
2. Explain the difference between Type A and Type B personality, including their effects on stress. *[4 marks]*
3. Outline the role of personality type in stress. *[4 marks]*
4. Discuss research into personality types as individual differences in stress. *[16 marks]*

Individual differences in stress: Hardiness

The specification says...

Individual differences in stress: hardiness including commitment, challenge and control.

Hardiness has been proposed as another difference between individuals in how they respond to stressors. Faced with the same stressful circumstances, some people become physically or psychologically ill (or both), but others not only seem protected against the ill-effects of stress they actually thrive.

Key terms

Hardiness A personality factor used to explain why some people seem able to thrive in stressful circumstances whereas others don't. It consists of three elements, nicknamed the Three Cs.

Commitment Hardy people throw themselves fully into all life has to offer them rather than standing on the sidelines.

Challenge Hardy people view stressful situations as opportunities for self-development rather than threats to their self-esteem.

Control Hardy people believe that stressful situations can be overcome through their own efforts.

Apply it Concepts

Developing hardiness

Stella works in a big organisation where there has been a lot of change in recent months. The job she used to do has changed beyond recognition and she is struggling to cope. Stella feels stressed all the time and finds it increasingly difficult to relax at home. She is ill more often than she used to be and has taken more days off work in the last two months than in the whole of the previous five years.

Question

How could Stella change her behaviour to become more hardy and therefore better able to resist stressors? Give examples referring to each of the Three Cs.

Study tip

There are two important research studies covered in detail on this spread. You can use the procedures and findings as a way to describe hardiness. However if you are asked 'What does research *show*?' then only the findings are relevant. Similarly, if you want to use these studies as evaluation then the findings should be your main focus, considering whether the findings support or challenge the theory.

Hardiness

Suzanne Kobasa (1979) proposed that **hardiness** is an aspect of **personality**, a set of characteristics that some people have but others don't. According to her co-worker, Salvatore Maddi (1986), hardiness gives us *existential courage* to deal with **stress** and the determination to keep going despite all the setbacks of life and the uncertainties we have about the future. Early research identified three dimensions to hardiness which are all related to cognitive appraisal – how a person perceives stressors as less threatening. They are collectively known as *the Three Cs*:

Commitment Hardy people are deeply involved in their relationships and their activities. They throw themselves into life, optimistic that they will get something valuable out of the experience. This is always better than withdrawing and becoming isolated. 'If something's worth doing, it's worth doing fully, even if it's stressful.'

Challenge Hardy people respond to change in a distinctive way. They are resilient and welcome change as an opportunity rather than as a threat. They recognise that life is unpredictable, but see this as exciting and stimulating. Stressful situations can help us to learn, and this is ultimately more fulfilling than retreating into comfort and an easy life.

Control Hardy people have a strong belief that they are in charge of events, that it is they who make things happen, rather than things happening to them. Even if those events are stressful, they actively strive to influence their environments rather than becoming powerless and passive observers of life passing them by.

Kobasa's research

Procedure Kobasa (1979) measured the life changes of 670 male American middle and senior managers aged between 40 and 49 years. She used the *Schedule of recent experiences* (the forerunner of the SRRS) to identify those who had experienced high levels of stress over the previous three years. She measured illness with the *Seriousness of illness survey* and recorded the number of days taken off work.

Findings The managers didn't all respond to the same stress in the same way. Some of them appeared to cope with their very stressful jobs without becoming ill or taking time off work. This subset of resilient managers scored highly on measures of challenge, commitment and control. Kobasa interpreted this finding as confirming the role of hardiness.

Maddi's research

Procedure Maddi (1987) spent several years studying 400 managers and supervisors at the Bell Telephone company in the US. During this time, the company underwent one of the biggest reorganisations in American corporate history. Thousands of people lost their jobs and it was an extremely stressful experience for the employees who stayed with the company.

Findings There were significant declines in performance and health in about two-thirds of participants. Outcomes included heart attacks, strokes, depression and drug abuse. But about one-third of the managers flourished. Their health did not deteriorate, they felt happier and more fulfilled at work than ever and seemed to be rejuvenated by the whole stressful experience. Again, these resilient managers scored highly on measures of the Three Cs. They basically welcomed the reorganisation as a challenge over which they could exercise control, and committed themselves into making it 'work for them'.



Hardy people welcome challenges – they find them invigorating rather than threatening.

Evaluation

Real-world application

One strength is that hardiness research has real-world applications.

Paul Bartone *et al.* (2008) measured hardiness in candidates applying for positions within the US Army Special Forces. This is a highly stressful job within the US military, so candidates endure a tough selection procedure including a four-week assessment course. The researchers found those who passed the course were significantly hardier than those who did not. Elite units of the US military now routinely select people with high levels of hardiness.

Therefore knowledge of hardiness might be useful in certain jobs to predict who can resist stress and who cannot.

Research support

Another strength is that the role of hardiness has been confirmed in many research studies.

For example, Richard Contrada (1989) studied **cardiovascular** responses in men to a stressful task in lab conditions. He found that those students who scored highest on a measure of hardiness had lower levels of resting blood pressure in response to the stressor. Interestingly, the lowest blood pressure levels were found in students who were not only hardy but also had **Type B** personalities (an interaction between personality characteristics).

This shows that hardiness affects the physiological stress response and may protect from some stress-related illnesses.

Counterpoint However, there are difficulties in measuring hardiness in research. For instance, the study by Contrada used five questionnaires to measure the different components of hardiness. The fact that hardiness cannot be measured fully by a single scale implies that the concept is vague and poorly defined. In fact, when Contrada analysed his data more closely, he found that only the challenge component of hardiness was linked to blood pressure. This raises more issues about how hardiness should be measured (see below for more on this).

This suggests that much research into hardiness, stress and illness is based on measures that lack **validity**.

Concept too broad

One limitation is that there is disagreement over the relative contributions of the Three Cs.

Jay Hull *et al.* (1987) recommended that research should only focus on control (and to a lesser extent commitment), and abandon the challenge component altogether. This is because there is much psychological research showing how important a sense of personal control is to well-being in various contexts. So control may be the crucial factor determining a hardy response to stressors. On the other hand, Contrada (1989, see above) provided evidence that challenge is the most important component.

This suggests the concept of hardiness is so broad it has very little validity and may not exist at all.

Evaluation eXtra

Direct or indirect?

Some research on this spread shows that hardiness has direct beneficial effects on health (e.g. Maddi 1987). When under stress, hardy people have a much reduced level of physiological arousal compared with non-hardy people.

However, the effects of hardiness may be indirect rather than direct. For instance, perhaps hardy people are more motivated to engage in healthy behaviours.

Consider: *Does it matter whether the effects of hardiness are direct or indirect?*



Hardy people are committed and resilient. They don't let impossible odds hold them back and are quick to bounce back.

Apply it Concepts — Exam hardiness

Salvatore and Suzanne are friends doing A levels at a sixth-form college. They both have exams coming up and Salvatore is worried. He knows from past experience that he goes to pieces at exam time. He just doesn't seem to cope very well with the stress. Suzanne, on the other hand, actually enjoys exams and has a really positive attitude towards them.

Question

Use your knowledge of psychological hardiness to explain how Salvatore and Suzanne respond to the stress of exams.

Apply it Methods — Workplace hardiness

A researcher decided to investigate the link between hardiness and illness. He recruited ten people from a local company and asked them to complete a *How hardy am I?* questionnaire. This produced a hardiness score for each participant on a scale between 0 (not hardy at all) and 20 (maximum degree of hardiness). The researcher also found out from their managers how many days of illness each participant had taken off in the past year. The researchers found a significant negative correlation between hardiness and illness.

Questions

1. The **questionnaire** consisted of **closed questions**. What is meant by this term? (*1 mark*)
2. Outline how the researcher could have selected a **systematic sample** of participants from the local company. (*2 marks*)
3. The researcher was concerned that the hardiness questionnaire lacked validity. Briefly outline *two* ways in which he could improve its **validity**. (*2 marks + 2 marks*)
4. Explain what is meant by the phrase 'a **significant negative correlation** between hardiness and illness'. (*3 marks*)
5. The researcher published his results in a psychology journal and it was later included in a **meta-analysis** into the link between hardiness and illness. Explain what is meant by a 'meta-analysis'. (*2 marks*)

Check it

1. In relation to individual differences in stress, explain what is meant by 'hardiness'. *[2 marks]*
2. In relation to hardiness, briefly explain what is meant by 'commitment' **and** 'challenge'. *[2 marks + 2 marks]*
3. Outline research (theories and/or studies) into hardiness as an individual difference in stress. *[6 marks]*
4. Describe **and** evaluate hardiness as an individual difference in stress. *[16 marks]*

Managing and coping with stress: Drug therapy

The specification says...

Managing and coping with stress: drug therapy (benzodiazepines, beta blockers).

Stress appears to be an inevitable part of everyday life, and it occasionally threatens to become overwhelming. So one of the most beneficial things psychologists can do is to help people *manage* the stress we all experience so it doesn't become too much to bear.

On this spread, we look at a physiological method of stress management – drug therapy. This method directly targets the biological systems that control the stress response, such as sympathomedullary and hypothalamic-pituitary-adrenal responses (see page 256).

Key term

Drug therapy Treatment involving drugs, i.e. chemicals that have a particular effect on the functioning of the brain or some other body system. In the case of psychological disorders such drugs usually affect neurotransmitter levels.

Apply it Concepts

Do I need drugs?

Larry often feels incredibly stressed. When things get too much for him he experiences physical symptoms and even becomes ill. He has heard that there are drugs available that might help him.

Question

Imagine you are Larry's friend, and he has approached you for information. Using your knowledge of managing stress, how would you explain to Larry how drugs work in very simple terms?

Drug therapy

The psychological symptom of **stress** we find most disturbing is the feeling of anxiety. This is accompanied by several unpleasant physiological symptoms characteristic of the **fight or flight response** (such as feeling sick, increased heart rate). **Drug therapy** can give relief from stress-related anxiety. Two broad categories of drugs are recommended to manage stress.

Benzodiazepines

Benzodiazepines (BZs) such as *diazepam* (Valium) lessen the anxiety associated with stress by quickly reducing physiological arousal in the **central nervous system** (CNS). BZs do this by enhancing the mechanism by which the body naturally combats anxiety.

Mode of action BZs enhance the activity of *gamma-aminobutyric acid* (**GABA**). GABA is a **neurotransmitter** that inhibits the activity of neurons in most areas of the brain. GABA combines with receptors on the **postsynaptic** neuron. This makes it less likely that the postsynaptic neuron will fire (i.e. produce an **action potential**), in turn making it less likely that signals will be passed on from one neuron to the next. In this way, GABA slows neural activity.

BZs enhance this natural inhibition, lowering CNS activity even further. Like GABA, BZ drug molecules also combine with receptors on the postsynaptic neuron. This makes the neurons more responsive to GABA and less responsive to other neurotransmitters. This means neural activity is inhibited throughout the CNS and the neurons cannot be stimulated by other neurotransmitters for a period. The individual feels less anxious and more relaxed as a result.

Beta blockers

Beta-adrenergic blockers (or **beta blockers** for short, BBs) act on **adrenaline** and **noradrenaline** (thus *adrenogenic*) and reduce arousal of the **sympathetic nervous system**. This is in contrast to BZs, which act more directly on the brain itself. Beta blockers such as *atenolol* (e.g. Tenormin) are commonly prescribed to reduce blood pressure and treat various heart problems.

Mode of action Adrenaline and noradrenaline are **hormones** produced as part of the fight or flight response or more technically, the **sympathomedullary pathway** (see page 256). As you may recall these hormones are released as an immediate response to a **stressor** and instantaneously circulate in the bloodstream to create the sympathetic response.

The hormones combine with *beta-adrenergic receptors* located throughout the **cardiovascular** system, mainly in the heart and blood vessels. This is why heart rate and blood pressure increase during stress. BBs block beta-adrenergic receptors, so the receptors cannot be stimulated by adrenaline and noradrenaline. Therefore heart rate and blood pressure do not increase and the heart pumps at its normal rate, so it does not need more oxygen. The end result is the individual does not feel anxious.

There are different types of BBs. Some act just on the receptors of the heart. Others have wider effects on the receptors of blood vessels and even the lungs. However they don't affect the brain and are therefore ideal for people who want to reduce anxiety but remain alert (e.g. actors, musicians, surgeons).



Beta blockers reduce anxiety without altering consciousness so they are ideal for people who want to eliminate the physical symptoms of stress but remain alert. Beta blockers also have performance-enhancing effects in tasks that need hand–eye co-ordination, so they are good for musicians and sports performance – in fact they may be too good, for example they are banned by the International Olympic Committee because such drugs are judged to give an unfair advantage.

Evaluation

Research support for BZs

One strength is high-quality research showing BZs are effective in treating anxiety.

The most convincing evidence comes from *randomised controlled trials* (RCTs), the 'gold standard' of studies into a drug's effectiveness. Half of the participants take a placebo, but neither they nor the researchers know who is in this placebo **control group**. The allocation of the participants to the placebo group and the drug group is **random** (hence 'randomised'). A review of studies by David Baldwin *et al.* (2013) concluded that BZs were significantly better than placebo in reducing acute anxiety.

This is strong evidence that BZs are a good choice of drug treatment for people wishing to reduce anxiety.

Research support for BBs

Another strength is that there is evidence for the effectivness of BBs.

A review by Desmond Kelly (1980) concluded that BBs reduced everyday anxieties associated with exams and even the civil disturbances of living in Northern Ireland in the 1970s. BBs can also be useful for people with social anxiety disorder, for whom speaking in public is a major stressor. Research studies have consistently demonstrated that BBs may be even more effective when used alongside drugs such as BZs (Hayes and Schulz 1987).

Therefore, drug combination therapy with BBs and BZs may be the best way to treat the physiological symptoms of stress for most people.

Counterpoint As the above research shows, drugs like BZs and BBs effectively reduce the physical symptoms of acute stress. However, they do nothing to remove the causes of stress. These causes are usually chronic (long-term), but the relief given by drugs is strictly short-term. Symptom reduction is a benefit but it is limited – when an individual stops taking the drug the symptoms return. But perhaps the worst consequence is that short-term symptom reduction can mask deeper long-term problems and prevent an individual from tackling them.

Therefore drug therapy is not a long-term solution to stress-related anxiety.

Side effects

One limitation of all drug treatments is their side effects.

Well-known side effects of BZs are drowsiness, weight gain, respiration problems (in some cases) and paradoxical reactions i.e the opposite outcomes to the ones you expect from treatment (Gaind and Jacoby 1978). Such reactions include criminal behaviour (e.g. shoplifting), other impulsive behaviours and uncontrollable emotional responses like weeping. BBs can reduce heart rate and blood pressure too much in some people, and they are not considered suitable for people with diabetes or severe depression.

Therefore side effects are problematic because, as a consequence, a person may stop taking the drug making them ineffective.

Evaluation eXtra

Costs and benefits

There are potentially serious costs to using drugs to manage stress. As you have seen above, side effects are a cost. We've also seen that drugs do not actually offer a cure for anxiety/stress. A further issue is dependency because BZs have been shown to be addictive if used for prolonged periods.

On the other hand drugs undoubtedly have some benefits. They give short-term relief (two to four weeks). This means that psychological therapies can be used because anxiety is controlled. Also, as you saw in drug treatments for OCD in Year 1, drugs are cost-effective and non-disruptive to people's lives.

Consider: *Do the benefits outweigh the costs or vice versa?*

Apply it Concepts — Treating exam stress

Moira is an A level student who panics when she thinks about exams and this makes it difficult for her to revise. She has heard that drugs called beta blockers are taken by people who experience performance stress, and she wonders if they might help her.

Question

If you were her doctor, what advice would you give Moira? Explain both the benefits and limitations of beta blockers, and consider whether there are any alternatives that might be more suitable.



Is she taking a placebo or the real thing? In a controlled drug trial, neither the researcher nor the participant knows the answer to this.

Apply it Methods — A drug therapy trial

Two researchers conducted a double-blind placebo trial to test the effectiveness of a drug in treating the effects of stress: 100 participants completed the *Feelings of stress* questionnaire, providing a score from 0 (feeling no stress at all) to 20 (feeling extreme stress). They were then randomly allocated to one of two groups. Participants in the experimental group were given a two-week course of the drug, but those in the placebo group were given an inactive version. At the end of two weeks, all the participants completed the questionnaire again.

Questions

1. Write a **non-directional hypothesis** for this experiment. *(2 marks)*
2. What **experimental design** is used in this study? (*1 mark*)
3. Explain *one* strength and *one* limitation of this design. *(2 marks + 2 marks)*
4. Explain how the participants could have been **randomly allocated** to the two groups. (*2 marks*)
5. Explain what is meant by **double-blind procedure** and how it could have been carried out. (*2 marks + 2 marks*)

Check it

1. In relation to managing **and** coping with stress, explain what is meant by 'drug therapy'. *[4 marks]*
2. Outline drug therapy as a method of managing stress. *[6 marks]*
3. Identify **and** evaluate **one** type of drug therapy used to manage stress. *[8 marks]*
4. Discuss drug therapy as a method of managing **and** coping with stress. *[16 marks]*

Managing and coping with stress: Stress inoculation therapy

The specification says...

Managing and coping with stress: stress inoculation therapy.

In contrast with physiological methods of dealing with stress discussed on the previous spread there are also *psychological* methods. These focus on the cognitive and/or behavioural aspects of coping, by helping people to think about stressors more adaptively, and by learning techniques that can combat the effects of stress.

Preparation is key in stress inoculation therapy. We can strengthen our ability to cope *before* we experience stressors. Rather like in the case of a vaccination against an infectious disease, we experience a weak 'dose' of a stressor to give us some immunity to more intense stressors when they arrive.

Key term

Stress inoculation therapy (SIT) Psychological method of stress management which helps individuals by first of all conceptualising the problem and identifying their own coping skills, then SIT aims to help develop new coping skills and finally exposes the individual to moderate amounts of anxiety to enable practice of coping.



A surgeon who is stressed is likely to experience some tension in their arms and hands. Drugs (see previous spread) are one solution for reducing stress, especially beta blockers. But cognitive behaviour therapies like SIT could be the best solution where anxiety may affect performance.

Apply it Concepts

A case of stage fright

Teri is a very talented singer and musician. She plays violin in a band and sings in choirs and groups. But recently she has been having a crisis of confidence. One performance did not go as well as she hoped, and since then Teri has started to think that she is nowhere near as good as the other people she plays and sings with. She now goes on stage expecting to perform badly, and her singing does seem to be suffering as a result.

Question

Use your knowledge of stress management to explain how Teri might benefit from stress inoculation therapy. Refer in your explanation to Teri's specific situation and to all three phases of SIT.

Stress inoculation therapy

Psychological methods of **stress** management are helpful for long-term support because it is often not possible for us to change a stressful situation. So the alternative is to change the one thing we do have control over – ourselves. **Stress inoculation therapy** (SIT) is a form of **cognitive behaviour therapy** applied to stress management that tries to change the ways we *think* about stress.

Don Meichenbaum and Roy Cameron (1973) identified three phases of SIT. Each phase focuses on the practical steps needed to help the client. The phases are not completely distinct, they overlap and there may be some working backwards to an earlier phase to refresh before moving on.

Phase 1 – Conceptualisation

SIT begins with a client and therapist working together to identify and understand the stressors the client faces. According to Meichenbaum (2007) there should be a warm and collaborative rapport. The therapist is supportive but the client retains responsibility for their progress. It is the client who is the expert on his or her own stress experiences, not the therapist.

The client learns about the nature of stress and its effects on the individual. For example, they learn that anxiety has many causes, including their own thought processes. So there is a focus in SIT on the client's **cognitive appraisal** of stressors and their own ability to cope with them. The main aim of this phase is for the client to understand that stressors can be overcome by viewing them as challenges. Part of this involves the therapist preparing the client to attribute success to their own skills and not to luck or chance or some other external agent (internal versus external **locus of control**).

Phase 2 – Skills acquisition and rehearsal

The client is helped to learn the skills they need to cope with stress. There are several such skills and the use of them is tailored to the client's specific needs. Examples include relaxation, social skills, communication and cognitive restructuring, where the client thinks about stressful situations more optimistically. A major element of skills acquisition is learning to monitor and use self-talk effectively. The client uses *coping self-statements* (such as 'You can do this!' or 'Stick to the plan!') to replace negative and anxious internal dialogue with more positive thoughts. The client plans in advance how to cope when stress occurs – how they can overcome it through the skills they have learned and the resources they can bring to the stressful situation.

Phase 3 – Real-life application and follow-through

The therapist creates opportunities for the client to try out their skills in a safe environment. Various techniques are used to increase realism. These include role playing, visualisation, even virtual reality and mobile apps. There is also a gradual transfer of these skills to the real world. The therapist sets homework tasks for the client to use in everyday life by deliberately seeking out moderately stressful situations and using coping skills. The client later feeds back to the therapist for discussion and further work if necessary. Meichenbaum calls these *personal experiments*. The therapist's involvement lessens as the client gains greater control over their anxiety.

Another important feature of this phase is *relapse prevention*. The therapist helps prepare the client to cope with setbacks. The likelihood of reversals is accepted and built into SIT. The client learns to cognitively restructure setbacks as temporary learning opportunities and not permanent catastrophic failures. This is all part of inoculation, to identify potential problems in advance and plan how to deal with them.

Duration of therapy

The duration of therapy varies from one client to another but typically it will be between nine and twelve sessions of an hour to an hour-and-a-half each. There could be one session a week for two to three months or they might be spread out over a longer period. At least one or two sessions are reserved for follow-up after several months.

Evaluation

Research support

One strength of SIT is research supporting its effectiveness.

Teri Saunders *et al.* (1996) conducted a **meta-analysis** of 37 studies into SIT effectiveness. They concluded that SIT is effective for reducing anxiety in performance situations (e.g. in exams or public speaking) and for enhancing performance under stress (e.g. doing better in exams). They also found that SIT was just as effective for people experiencing extreme anxiety as it was for those with moderate or normal levels. Surprisingly, the effectiveness of SIT did not depend on how experienced the therapist was.

This suggests that SIT works for a wide range of people with anxiety and can help change behaviour in a positive direction.

A demanding therapy

One limitation of SIT is that it is highly demanding of clients.

Clients have to make big commitments of time and effort and must be highly motivated for SIT to work. The training involves a lot of self-reflection and learning of new skills. The third phase of applying SIT techniques to everyday life is especially challenging, which means the therapy is not suitable for everyone. For example, some people are less able than others to use coping self-statements when they are experiencing anxiety in a stressful situation.

Therefore the demands placed on clients and their experiences of failure mean that many do not continue the treatment.

Counterpoint However, although SIT is demanding, it is also flexible. It incorporates a variety of stress management techniques in the skills acquisition phase. Techniques can be tailored to specific needs to encourage commitment and motivation. For example, some skills may be especially suitable for elderly people, or people with learning difficulties. SIT can be used with individuals, couples, groups and families, in a variety of settings. Duration of training can be from 20 minutes to 40 or more hours over several months. It can be managed online.

This flexibility means SIT can help clients manage almost any form of stress.

Overcomplicated

Another limitation is that SIT is overcomplicated.

SIT uses lots of different techniques to target a variety of stressors and symptoms. But there may be just one factor common to all the elements of SIT – personal control. SIT works because, as the client's coping skills develop, he or she gains a growing feeling of control over stressful situations. This was illustrated in a study by Dorothea Hensel-Dittman *et al.* (2011). They found that SIT was ineffective when used with people who could not exert any control (the clients were asylum seekers with post-traumatic stress disorder caused by torture who could have been deported at any time).

This suggests that control may be the vital element of SIT because the therapy does not work with people who have no opportunity to exert control.

Evaluation eXtra

Quick fix versus slow fix

When comparing methods of managing stress, SIT may be better because it is a 'slow fix' – it is 'future oriented' and its benefits are longer-term. Clients learn techniques so that they can cope when the same stressful situations arise again.

However, drugs may be preferable because they are a 'quick fix' for anxiety. No effort is required except remembering to take a pill each day. Furthermore anxiety reduction may provide a window to learn to cope with the situation.

Consider: *Which is best, the quick fix or the slow fix?*



The central concept of SIT is the psychological counterpart of vaccination against physical diseases such as measles.

Apply it Concepts — Drugs or SIT?

Don has been experiencing a great deal of stress recently, and has decided that he needs some help. He knows that drugs and SIT are two commonly-used methods for managing stress, but he is finding it hard to choose between them because they both have certain strengths and limitations.

Question

If Don asked you for advice, what would you tell him?

Apply it Methods — Assessing SIT

A researcher carried out a study into the effectiveness of stress inoculation therapy. She recruited 40 participants and allocated them to one of two groups. 20 participants underwent a course of six SIT sessions, one per week. The other 20 took part in a discussion group for six sessions, but no specific SIT techniques were used. Levels of perceived stress were assessed by questionnaire before and after the six-week period. The scale used went from 0 (no stress at all) to 50 (extreme stress). The SIT group's median score improved by 16 points, but for the discussion group the corresponding figure decreased by 7.

Questions

1. What was the **operationalised dependent variable** for this study? *(2 marks)*
2. Explain why 20 of the participants took part in a discussion group. *(2 marks)*
3. Outline *one* way in which the researcher should take care to follow the British Psychological Society's *Code of Ethics*. *(2 marks)*
4. Explain *one* reason why the **median** was used as a measure of central tendency in this study. *(2 marks)*
5. Briefly explain how research such as this can benefit the economy. *(2 marks)*

Check it

1. Explain what is meant by 'stress inoculation therapy'. *[3 marks]*
2. Outline stress inoculation therapy as a method of coping with stress. *[6 marks]*
3. Explain **one** limitation of stress inoculation therapy as a method of coping with stress. *[4 marks]*
4. Describe **and** evaluate stress inoculation therapy as a method of managing **and** coping with stress. *[16 marks]*

Managing and coping with stress: Biofeedback

The specification says...

Managing and coping with stress: biofeedback.

Many of our muscles can be stretched or contracted voluntarily, in order to reach out and pick something up, for example. But some muscular activity is involuntary, like the contractions of the gut involved in digestion. Other involuntary processes include those linked to the stress response, such as heart rate, blood pressure and sweating. Biofeedback was developed to gain conscious control over involuntary physiological processes that are involved in the stress response.

Key term

Biofeedback A method of stress management that turns physiological processes such as heart rate into signals that a client then learns to control. Clients do this by applying the techniques they have learned, such as relaxation and cognitive restructuring.

Study tip

When describing biofeedback, it's good to include the concepts behind it such as its basis in conditioning. But central to any description should be the steps of the training procedure itself. What does the client practically have to do? How is the technology actually used? What are the phases involved in biofeedback? Become familiar with the process so you can describe each element in detail.

Apply it Concepts

Using biofeedback

Jav has heard that there are many methods that might be able to help him cope better with stress. He doesn't want to use drugs because he is worried about the side effects, and he thinks that stress inoculation therapy would be too much of a commitment. He has heard that biofeedback could be suitable, so he is keen to learn more about it before he goes to see his doctor.

Question

How would you explain to Jav the processes involved in biofeedback? Refer to the different phases of the procedure and what he will be expected to do. Address his concerns about the other two methods in your explanation.

Biofeedback

The aim of **biofeedback** is to give people control over involuntary physiological processes associated with **stress**. The reason we can't normally control these internal processes is because we have no feedback from them. So biofeedback provides that information using technology that allows us to see or hear our physiological functioning.

Aims of biofeedback

The client is connected to a machine which converts physiological activity into a visual or auditory signal. A physiological activity (such as heart rate) is monitored, the signal is amplified and fed back immediately to the client via a display on a monitor or the sound of a tone through earphones.

For example, muscular tension can be measured using an **electromyogram** (EMG), with electrical activity of the muscles converted into a tone of varying pitch. An **electroencephalogram** (EEG) measures brain activity, which can be shown on a screen. The same goes for **skin conductance responses** (see page 266) that indicate sweating activity. Heart rate monitors are widely available these days, even as mobile apps. These machines give visual or auditory feedback providing a meaningful representation of the physiological process being monitored.

The training procedure

Thomas Budzynski (1973) has identified three main phases to biofeedback training:

Phase 1 Awareness This is an educational phase with a lot of input from the trainer/therapist. A client learns to become aware of their physiological response. For example, they learn that reducing heart rate moves the line of a graph on a screen. Or reducing muscle activity lowers the pitch of an audible tone.

Phase 2 Learn control The client next learns to apply stress management techniques they have practised (e.g. using deep relaxation training to tighten and relax specific muscle groups). As the client relaxes his or her muscles (or slows their heartbeat or breathing, etc.), changes then appear in the biofeedback tone or graph. This, along with praise from the therapist, is rewarding and reinforces the client's behaviour, making further success more likely (i.e. **operant conditioning**).

Biofeedback with children (and increasingly with adults) uses a game-based interface where a client has to adjust their physiological response to successfully complete an on-screen maze.

Phase 3 Transfer Control of the response has to be transferred to everyday life, so the client practises in stressful situations rather than in the safety and comfort of a therapy room. No machine is now involved.

Davis's research

Henry Davis (1986) used EMG biofeedback with women receiving treatment for breast cancer.

Procedure There were thirteen 45-minute sessions held over an eight-week period, during which the 25 patients learned deep-breathing and relaxation techniques.

Findings After eight months, levels of urinary **cortisol** and self-reported anxiety were **significantly** lower in these patients than they had been at the start of the study. In a group of **control** participants, who had no form of therapy, cortisol levels increased. Davis concluded that this was evidence of significant stabilisation of the **hypothalamic-pituitary-adrenal system** by biofeedback.



Biofeedback devices these days are smaller, more portable and less expensive than they used to be.

Evaluation

Research support

One strength of biofeedback is research support for its effectiveness.

Jane Lemaire *et al.*'s (2011) participants were medical doctors who were trained to use a biofeedback device. They used it three times a day over a 28-day period and also completed a questionnaire measuring their perception of how stressed they were. The **mean** stress score for the biofeedback users fell significantly over the course of the study. The corresponding score for a **control group** also fell, but by a much smaller amount.

This suggests that biofeedback can help to improve the psychological state of someone experiencing stress.

Counterpoint However, Lemaire *et al.* also took regular measurements of heart rate, blood pressure and cortisol levels. There were no significant changes in these physiological measurements between the start and end of this study. Therefore biofeedback had very little effect on objective, physiological indicators of the stress response (no more effect than **placebo**).

Therefore the effectiveness of biofeedback depends on the outcome measure, what it is you actually aim to 'treat'.

Convenient therapy

Another strength of biofeedback is its relative convenience.

Biofeedback is very easy to use and inexpensive because of developments in technology. Recent devices are about the size of a mobile phone and work by representing the targeted function (e.g. heart rate) with colours. The client tries to change the colour of the display by controlling his or her breathing to reduce heart rate. This makes biofeedback enjoyable, easy-to-use in everyday situations and also requires no supervision.

This means that people are likely to continue biofeedback treatment to the point where it is successful.

Challenging therapy

One limitation is that biofeedback can be very demanding.

Biofeedback does not suit everyone. A person needs to understand the relationship between their physiological functioning and the visual/auditory signals they are receiving. They also need to be very motivated to apply their skills to alter these signals. Motivation can be improved by introducing a gaming element. But a person also has to practise the skills they have learned in the real world outside the safety of the clinic.

This means that many people drop out of biofeedback so it is hard to assess just how successful it really is.

Evaluation eXtra

Just relax?

Biofeedback training involves relaxation and operant conditioning. It may be the operant conditioning that brings the benefits of biofeedback. The client's heart rate eventually reduces 'automatically' without her or him having to consciously think about it.

However, it may be the relaxation itself that reduces heart rate. Learning the skill of relaxation can give a client the tools to lower their stress response. Also, a client gains greater control over their physiological functioning so they feel less stressed.

Consider: *Is biofeedback necessary or is relaxation enough?*



Do the benefits of biofeedback come from relaxation techniques taught alongside it? If so, then meditation might be just as effective.

Apply it Concepts — Which is best?

Two students are having a discussion about stress management techniques. Harry is a biology student and his argument is that physiological methods are superior. But Adrianne – a psychology student – thinks that psychological methods are better.

Question

How would you use your knowledge of stress management to settle this argument? What would your position be?

Apply it Methods — Did it work for you?

Biofeedback is a controversial method of stress management. There is much debate about its effectiveness, and it seems to work for some people but not for others. A psychologist decided to address this issue by investigating people's experiences of biofeedback. She carried out face-to-face interviews with 47 women and 38 men. She asked questions about their perceptions of whether biofeedback had helped them cope better with stress, and the reasons why or why not.

Questions

1. Outline *one* strength of gathering **qualitative data** in this study. (*2 marks*)
2. Explain *two* differences between a **structured** and an **unstructured interview**. (*2 marks + 2 marks*)
3. Identify an alternative method that could have been used to collect data about biofeedback experiences in this study. Explain why this might be a better method than an interview. (*4 marks*)
4. Calculate the proportions of women and men as percentages of the total number of participants (*two* percentages). (*4 marks*)
5. The psychologist wanted to calculate the average length of time participants used biofeedback. Which **measure of central tendency** would you advise her to use, and why? *(1 mark + 2 marks)*

Check it

1. In relation to managing stress, explain what is meant by 'biofeedback'. *[3 marks]*
2. Outline biofeedback as a method of managing stress. *[6 marks]*
3. Explain **one** limitation of biofeedback as a method of managing stress. *[4 marks]*
4. Discuss biofeedback as a method of managing **and** coping with stress. *[16 marks]*

Managing and coping with stress: Gender differences

The specification says...

Managing and coping with stress: gender differences in coping with stress.

It has often been noted that women tend to live longer than men. Psychologists have wondered if this gender difference might be linked to stress, and have suggested three possibilities. It could be that different physiological responses to stress have evolved in males and females. On the other hand, perhaps women behave differently in terms of stress-related matters such as lifestyle. Or maybe women have more constructive ways of coping with stress.

Key term

Gender differences The ways in which men and women differ behaviourally and psychologically, and which may be due to biological differences and/or due to socially-defined expectations of men's and women's behaviour.

Apply it Concepts

Roland's coping method ...

Like a lot of students, Roland gets pretty stressed in the run-up to exams. He has always tried to cope with them in the same way – by thinking carefully how he will plan his time to avoid as much stress as possible.

Questions

1. What method of coping with stress is Roland using?
2. Based on your understanding of gender, what else is he likely to do to cope?

Stereotype or reality? Is it true that men take a more problem-solving approach in times of stress than women?



Gender differences

It is easy to stereotype male and female responses to **stress** (men bottle things up, women talk openly to their friends). But has psychological research found that there are **gender differences** in strategies to cope with stress?

Gender-related coping methods

Some researchers have suggested that men tend to use *problem-focused* methods of coping with stress, but women generally use *emotion-focused* methods.

This broad distinction between problem- and emotion-focused coping was first made by Richard Lazarus and Susan Folkman (1984). Problem-focused methods reduce stress by tackling its root causes in a direct, practical and rational way. This typically involves taking control to remove or escape from the stress, and learning new skills such as time management or relaxation techniques. Emotion-focused methods reduce stress indirectly by tackling the anxiety associated with a stressor. Ways of doing this include various forms of avoidance, such as distraction and keeping busy. It is also possible to use **cognitive appraisal** to think about the stressor more positively.

Research Although most people use some combination of both methods, some research supports the view that there are gender differences in coping methods. Brennan Peterson *et al*. (2006) assessed the coping strategies of men and women who had been diagnosed as infertile. They used several measures including the *Ways of coping* **questionnaire** (Folkman *et al*. 1986). A key gender difference emerged. Women were more likely to accept blame and use various avoidance tactics, both of which are characteristic of an emotion-focused approach. Men were more likely to use problem-solving that involved making plans, a feature of a problem-focused approach. However, there is contrary research on this point (see facing page).

Tend and befriend

There is some evidence men and women have different physiological responses to stressors. The typical response to an acute stressor, in humans and other animals, is **fight or flight** (see page 256). But Shelley Taylor and her colleagues (2000) point out that most research into this response has been conducted with males. So 'fight or flight' does not necessarily best describe the stress response of females. From an evolutionary perspective, fight or flight is disadvantageous for a female because confronting or fleeing from a predator would make it harder to protect offspring.

Therefore what has evolved in females is a different response to stressors, which Taylor *et al*. (2000) call **tend and befriend**. Tending is protecting, calming and nurturing offspring and blending in with the environment rather than confronting a threat. Befriending involves seeking support from social networks at times of stress in order to cope.

Research Anne Luckow *et al*. (1998) reviewed 26 studies of gender differences in 'seeking and using social support' as a way of coping with stress. Women were much more likely to use this method in 25 of these studies. So it seems that women very strongly favour befriending in stressful situations, much more so than men.

But this befriending is selective – it tends to be with other women. Brian Lewis and Darwyn Linder (2000) found that most of the women in their study, when confronted with a stressful experience, preferred to wait for support from other women rather than seek it from a man. This may in part have evolved as a mechanism for protecting females and their offspring against threatening males, even close family members.

Oxytocin

Biochemically, the tend and befriend stress response is driven by **oxytocin**, a **hormone** produced by males and females. Oxytocin promotes feelings of goodwill and affiliation with others, and has a role in the formation of the mother–baby **attachment** bond. It also helps the body recover more quickly from the physiological effects of a stressor.

Taylor *et al*. (2002) found that higher levels of oxytocin were linked with lower **cortisol** levels in their female participants only. There was also a quicker recovery of the **HPA system** (see page 256) after exposure to a stressful task. It appears that the female sex hormone **oestrogen** increases the effects of oxytocin, but male hormones (**androgens**) reduce them. Thus oxytocin effects are stronger in women, generally creating a reduced stress response.

Practical activity on page 283

Evaluation

Emotion- and problem-focus

One limitation is that there is no clear distinction between coping strategies.

In the study by Peterson *et al.* (2006) on the facing page, we saw that there was a gender difference in coping amongst men and women referred for IVF. However, there were many more gender similarities than differences. In fact, the researchers found that men and women used coping methods that could not be easily categorised as emotion-focused or problem-focused. For example, seeking support from others can be either or both. Women and men used social support extensively, sometimes to seek information (problem-focused) and sometimes to help them feel better (emotion-focused).

This suggests that the distinction between emotion- and problem-focus is unworkable and that it is not valid to conclude that women mostly use one and men the other.

Research support

One strength is research support for the tend and befriend response in females.

Lisa Tamres *et al.* (2002) carried out a **meta-analysis** of 26 studies comparing the coping strategies of men and women. Women were significantly more likely than men to use social support at times of stress (tend and befriend). Women create, maintain and use social networks in order to promote caring for others (offspring mainly). A side effect of this is that women are more likely to receive support from others at times of stress that reduces its negative impact (see next spread).

This suggests that there are gender differences in tend and befriend, with this response being more prevalent in females.

Counterpoint However, fight or flight can sometimes be more adaptive for females than tend and befriend. Taylor *et al.* (2000) point out that protection of offspring is a complex task requiring a flexible response. So females will sometimes be aggressive ('fight') in order to protect their offspring. It is also true that men's coping response can sometimes be tend and befriend in situations where it is more adaptive. Oxytocin also plays a role in the stress response in men as well as in women.

This suggests that the distinction between men and women in the use of social support/tend and befriend is in fact blurred and complex.

Retrospective research

Another limitation is that many studies of emotion- and problem-focused coping involve retrospective recall.

Participants think back to stressful occasions and recall the methods they used to cope. Denise De Ridder (2000) found that women reported using emotion-focused coping more than men. This is the expected finding, but it only occurred when the participants recalled retrospectively. The researchers also used a different method of recording behaviour called *ecological momentary assessment* (EMA). This is a concurrent method in which participants report their coping strategies at regular intervals during the day (i.e. as they happen). The gender difference disappeared using this method.

Therefore the gender difference in coping focus may depend very much upon what participants can remember.

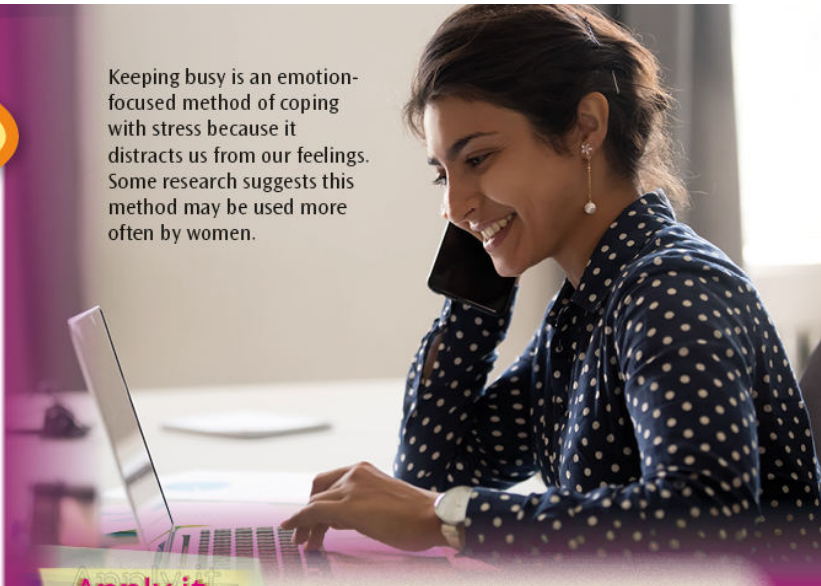
Evaluation eXtra

Gender or stressor?

It may be that men and women tend to use different ways to cope with stress because of biological differences, in particular levels of the hormones testosterone, oestrogen and oxytocin. Men may be more likely to respond to stress with 'fight or flight' and women with 'tend and befriend'.

On the other hand, perhaps women and men use different coping methods because they face different stressors (a social, role-based explanation). For example, women face more relationship-related stressors than men (so emotion-focused strategies are more suitable).

Consider: *Are differences in coping methods really due to gender?*



Keeping busy is an emotion-focused method of coping with stress because it distracts us from our feelings. Some research suggests this method may be used more often by women.

Apply it Methods — Assessing coping methods

A researcher was interested in investigating gender differences in coping with stress. He selected 20 men and 20 women, all of them carers for a spouse with Alzheimer's disease. The carers filled in a questionnaire to assess the methods they used to cope with stress. Based on their responses, each participant was classified as either emotion-focused or problem-focused in their approach to coping with stress.

Questions

1. Explain *one* strength and *one* limitation of using a **questionnaire** in this study (*2 marks*)
2. Write a **directional hypothesis** for this study. (*2 marks*)
3. Outline how the researcher might have selected a **volunteer sample** of suitable participants. (*2 marks*)
4. A friend of the researcher disagreed with this result. He knows lots of men who are emotion-focused and women who are problem-focused in managing stress. Explain why the friend's personal opinion is no substitute for scientific evidence. (*4 marks*)

Apply it Concepts — … And Shelley's too

Shelley is Roland's twin sister (see facing page). Her approach to dealing with stress has always been very different from her brother's. She prefers to keep herself as busy as possible so she doesn't have to think too much about her upcoming exams and get anxious.

Questions

1. What method of coping with stress is Shelley using? How does it differ from Roland's preferred approach?
2. Explain why Shelley is more likely than Roland to seek out her friends at exam time.

Check it

1. Describe **one** gender difference in coping with stress. *[4 marks]*
2. Outline what research has found about gender differences in coping with stress. *[6 marks]*
3. Explain **one** limitation of research into gender differences in coping with stress. *[4 marks]*
4. Describe **and** evaluate research into gender differences in coping with stress. *[16 marks]*

Managing and coping with stress: The role of social support

The specification says...

Managing and coping with stress: the role of social support in coping with stress; types of social support, including instrumental, emotional and esteem support.

'Many relationships may be better for the having of them than the using of them' (Taylor 2011).

It may be just as valuable to know you have friends you can call on for support as actually calling on them. There is always the danger that actively calling upon support from a social network leaves you open to rejection, making the situation worse. Just believing that you can get help if you need it avoids having to test this possibility.

Key terms

Social support The word 'social' refers to other people, so social support is the assistance you get from others – friends, family, social influencers etc.

Instrumental support Practical help such as lending money, cooking a meal, providing information.

Emotional support Giving someone a 'shoulder to cry on' to help them feel better.

Esteem support Helping someone to attach greater value to themselves so they view their abilities with greater confidence.

Study tip

Be careful when explaining different types of social support. If you have to explain one type (e.g. esteem support) then limit yourself to that one and don't be tempted to stray. On the other hand, if you need to explain social support in general, then you should aim to include something about all three types.



Social support – it's all about what others can do for you.

The role of social support

Types of social support

Social support refers to the support we get from other people. As we saw on the previous spread, this kind of support is especially common in women who are more likely to respond to **stress** by 'tending and befriending' others. However we also saw that men use social support.

On the previous spread we categorised support as being emotion- or problem-focused but Mark Schaefer *et al.* (1981) have offered a slightly different distinction – they have called 'problem-focus' instrumental support and added a third kind of support from others – 'esteem support'. Thus they have identified at least three distinct forms of social support:

1. **Instrumental support** This is practical and tangible support, which could be in the form of physically doing something to help (e.g. giving someone a lift to the hospital) or providing information (telling someone what you know about stress).
2. **Emotional support** This is summed up when we say things like 'I really feel for you', or 'I'm sorry you're going through such a tough time'. It expresses warmth, concern, affection, and sympathy. Emotional support isn't intended to offer practical help, but rather to make the stressed person feel better, to lift their mood.
3. **Esteem support** This is when we try to reinforce someone's faith in themselves, their belief in their ability to tackle a stressful situation. We might express our confidence in them, increasing their confidence in themselves and reducing their feelings of stress.

There is a lot of overlap between these types. For example, being a 'shoulder to cry on' could conceivably involve all three. Even instrumental support can help emotionally because of what it means to the individual who receives it – it is a sign of caring.

All three types can be provided without physical presence. Emotional and esteem support are given every minute of every day over online social networks such as Facebook and Twitter. Or money sent with a card through the post offers instrumental support without anyone meeting face-to-face. Social support can come from someone who doesn't know you, such as advice on a TV programme.

Cohen *et al.*'s research

Social support (especially emotional) can be expressed through physical touch. Sheldon Cohen *et al.* (2015) wondered if hugs offered protection against stress-related infections.

Procedure The researchers phoned 404 healthy adult participants every evening for 14 consecutive days to measure the number of hugs they received each day. The participants also completed a **questionnaire** to assess *perceived* social support. Stress was measured in terms of daily interpersonal conflicts (e.g. arguments). The researchers then placed the participants in quarantine, exposed them to a common cold virus and monitored them for signs of illness (stress is an **immunosuppressant** so we expect people who are more stressed to become ill).

Findings The participants who experienced the most interpersonal conflict (i.e. stress) were most likely to become ill. But those who perceived they had greater social support had a **significantly** reduced risk of illness. Hugs accounted for up to one-third of the protective effect of social support. Participants who had the most frequent hugs were less likely to become infected and, for those who did, the symptoms were less severe than for those who had fewer hugs. This shows that perceived social support can act as a protection against stress.

Apply it

Concepts

Helping hands

Danuta often feels the negative effects of stress. She finds it difficult to function normally because of this. But fortunately she has a lot of friends who try their best to help. Some give Danuta lifts in their cars to her various medical appointments. Others spend time with her, talking and listening to her sympathetically. And others reassure her that she is a worthwhile person with a lot to offer.

Questions

1. Identify the types of social support being shown to Danuta.
2. How do the various forms of support help Danuta in her attempts to cope? Refer to psychological research in your explanation.

Evaluation

Research support

One strength of social support is research confirming its usefulness.

For example, Fawzy Fawzy *et al.* (1993) **randomly allocated** patients with malignant melanoma (skin cancer) to a support group for just six weeks, one session a week. The group provided an opportunity for patients to express their feelings (emotional support) but also to get information and advice about their illness (instrumental support). Six years later, the support group patients had better NK cell functioning (a type of white blood cell, see page 258), and were more likely to be alive and free of cancer than patients in a **control group**.

This shows that there are substantial benefits to social support that last long after it is given.

Counterpoint However, when Fawzy *et al.* (2003) analysed the results of a ten-year follow-up, social support was not so beneficial. They found that there was no significant difference in recurrence of the cancer between the intervention (social support) group and the control group. There was a small benefit for the support group in survival rates, but it was much weaker than it had been in the earlier study.

This suggests that social support can be beneficial, but such benefit gradually disappears over time.

Gender differences

One limitation is that social support benefits both women and men differently.

One of the most reliable findings in stress research is that women and men benefit from social support but in different ways – though it depends on the type of social support. Anne Luckow *et al.* (1998) reviewed studies into gender differences in social support coping. Women used emotional social support to cope with stress much more than men. However, in many cases men used instrumental (problem-focused) support more than women (as discussed on the previous spread).

This suggests that men may only benefit from the support of others in certain circumstances.

Negative effects

Another limitation is that social support can have negative effects.

The effects of social support depend on who gives it and what type they give. Emotional support is usually welcomed from friends and relatives, and sometimes even from strangers (e.g. online social media). But instrumental support (i.e. information) from these sources is much less reliable than from medical professionals, for example. Even emotional support from a relative or friend can sometimes be unhelpful. For instance, if they insist on coming with us to a hospital appointment, we might end up feeling more anxious than if we went alone.

This suggests that social support is not universally beneficial but depends on many factors.

Evaluation eXtra

Support versus hardiness

We have seen several indicators that social support is an effective means of coping with stress. For example, Cohen *et al.* (facing page) found some direct benefits on the immune system. Also, we have seen that support can be beneficial for both women and men in different ways.

However, social support may be less beneficial than hardiness. As we saw on an earlier spread, Suzanne Kobasa (1979) argued that being hardy reduces the effects of stress. Furthermore, unlike hardiness, social support can have negative effects.

Consider: *How valuable is social support relative to hardiness?*



Support isn't always welcome. It can backfire if the supporter insists on offering it, making us more stressed than ever.

Apply it Concepts — Online social support

Colleen collects friends on Facebook. She never defriends anyone so now has a network of hundreds of people and spends a lot of time exchanging posts with many of them. She feels they are a real source of support even though she knows very few of them in the offline world. Dylan has only a handful of friends on Facebook, but is very close to all of them and they spend a lot of time together offline.

Question

Which of Colleen and Dylan is likely to get the best support from their social networks? Explain your answer, referring to types of support and any other relevant issues.

Apply it Methods — A stress case study

A researcher into the psychology of stress decided to investigate the reasons why people seek social support. He carried out a case study of a woman who was going through a very stressful period in her life. He used various techniques for collecting data about the types of social support she was receiving and her reasons for seeking it.

Questions

1. Describe *one* technique that the researcher could have used to collect data in this **case study**. (*2 marks*)
2. Explain *one* strength and *one* limitation of conducting this case study. (*2 marks + 2 marks*)

The researcher published the case study in a scientific journal.

3. What is the purpose of the discussion section of such a report? *(2 marks)*
4. How could the researcher maintain his participant's **confidentiality** when the report is published? (*3 marks*)
5. Explain *one* other **ethical issue** that could arise in this case study and how the researcher could deal with it. (*2 marks + 2 marks*)

Check it

1. In relation to coping with stress, explain what is meant by 'instrumental support' and 'esteem support'. *[2 marks + 2 marks]*
2. Explain when emotional support might be better than esteem support when coping with stress. *[4 marks]*
3. Outline the role of emotional support in coping with stress. *[2 marks]*
4. Discuss the role of social support in coping with stress. *[16 marks]*

Practical corner

The specification says...

> Knowledge and understanding of ... research methods, practical research skills and maths skills. These should be developed through ... ethical practical research activities.

This means you should conduct practical activities wherever possible. On this spread, you will find a correlational study looking at the possible links between daily hassles and illness. There is also a quasi-experiment that uses a questionnaire to collect data. There is some flexibility to this practical, though, as you can easily turn it into an interview and content analysis.

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?



Sometimes the hassles of everyday life just make us want to go back to bed.

Practical idea 1: Daily hassles and illness – is there a link?

The relationship between everyday sources of **stress** and illness has been much investigated. Findings are mixed, but many psychologists argue that **daily hassles** are more strongly associated with illness than major **life changes**.

The main aim of this practical is to find out if there is a link between hassles and illness in a sample of students. This is also an opportunity for you to construct your own scale to measure an important source of stress.

The practical bit

Designing your scale

You could use any freely-available scale to measure daily hassles, but there are two problems with this approach. Scales such as Allen Kanner *et al.*'s (1981) original *Hassles scale* are very lengthy and quite likely to test the patience of your participants. Also not all are applicable to students (though there are some). So a better solution is to produce your own tailor-made scale.

You will need to think up some daily happenings that fit the definition of a hassle – a relatively minor but frequent occurrence that causes annoyance or irritation. They should be ones likely to be experienced by your **target population** of students. Decide on a maximum number of hassles, probably no more than 20, and of different types. If you get short of ideas, you could refer to Kanner *et al.*'s original for inspiration. You should be able to find this with the aid of your preferred internet search engine.

Another decision relates to the measurement scale you are going to use. The original scale measured the severity of each hassle with three points (somewhat, moderately, extremely). You might want to use different wording or even a different size scale (e.g. a 10-point scale). Think carefully about your **standardised instructions** and include them with the scale. Make sure you indicate the period of time over which you want participants to recall the hassles they have experienced (e.g. one week or one month).

Ethical issues

Hassles are relatively minor so they are unlikely to provoke distress or be interpreted as personal or an invasion of privacy. Even so, you should keep these issues in mind when constructing your scale and writing your standardised instructions. You should also, as ever, pay attention to **informed consent** and how to obtain it, and make your participants' **right to withdraw** clear.

Selecting your participants

An **opportunity sample** of students is perfectly acceptable for this practical. Your school or college canteen is the most obvious place to recruit individuals, although distributing questionnaires to whole classes is straightforward as long as you get permission. If you approach individuals, you need to make sure there is somewhere relatively quiet available to fill out the scale for a few minutes.

Using the scale

You could look at the relationship between daily hassles and self-reported illness or absenteeism from school or college. For absenteeism, you might ask your participants to simply estimate how many days off school or college they have had over a specified period. If illness is what you wish to measure, then construct a brief scale asking participants to indicate how many times they have been ill in the specified period and to rate the severity of each illness, again on a scale of your choosing.

Analysing and presenting your data

You could **correlate** overall hassles score with illness severity score. This is a good chance to draw a **scattergram** to visualise the relationship between the two variables. You could also calculate appropriate measures of central tendency for each variable and place them in a table. Finally, apply a suitable **statistical test** to establish the statistical significance of the correlation you have found (see pages 78–79).

Apply it – Methods

The maths bit 1

1. What is the **level of measurement** of the two variables in Table 1 on the right (hassles score and illness severity score)? Explain your answer (*1 mark + 1 mark*)
2. Calculate a suitable **measure of central tendency** for the two variables. (*1 mark + 1 mark*)
3. Calculate a suitable **measure of dispersion** for the two variables. (*1 mark + 1 mark*)
4. Draw a suitable graph to represent the data in Table 1. (*4 marks*)

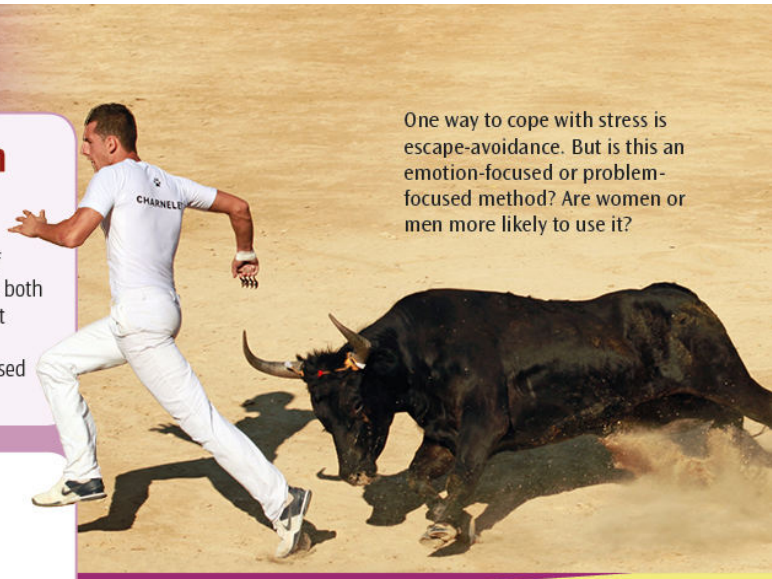
Table 1 Hassles score and illness severity score.

Participant	Hassles score	Illness severity score
1	44	9
2	32	6
3	13	4
4	24	5
5	17	4
6	35	6
7	29	8
8	54	7
9	26	5
10	40	7

Practical idea 2: Do men and women cope differently?

Richard Lazarus and Susan Folkman (1984) distinguished between two major ways of coping with stressors – **emotion-focused** and **problem-focused**. Although we all use both of these when we need to, there is some evidence that women and men have distinct preferences.

The aim of this practical is to test the claim that women tend to use emotion-focused methods and men use problem-focused methods.



One way to cope with stress is escape-avoidance. But is this an emotion-focused or problem-focused method? Are women or men more likely to use it?

The practical bit

Designing the study

This study is a **quasi-experiment** because the **independent variable** is gender. The **dependent variable** is method of coping with stress, emotion-focused or problem-focused. You can construct your own **questionnaire** to measure coping styles.

The questionnaire

First, think about different coping methods that fall into the categories of emotion-focused or problem-focused. Once you have done that, you can devise some questions that assess each method. An ideal way to do this is to be guided by Folkman *et al.*'s (1986) *Ways of coping* questionnaire, which is widely available on the internet.

Don't just reproduce the same items, but use them to make your own, ones that are more suitable for your **target population** (that is probably students, but it doesn't have to be – see below). Limit the number of items you create, but make sure you have equal numbers related to emotion-focused and problem-focused methods (perhaps ten of each). Decide on a scale of measurement, perhaps from 'never use that method' to 'use that method a lot' with maybe three points in-between. Produce some standardised instructions and make sure they are clear and easy to follow without any further clarification.

There is an alternative to asking **closed questions**, and that is to give your participants the chance to tell you about their coping methods in their own words. You could devise some **open questions** and leave space for responses, or even consider using a **semi-structured interview** method instead. The downside is that it becomes more difficult to analyse the data you collect. But it would be a good opportunity to apply **content analysis** techniques to test the **hypothesis** about a gender difference.

Sampling method

Opportunity sampling is, as always, a very convenient way of recruiting participants, especially students. However, for a bit of variety, and to make your sample slightly more representative, you could extend your target population a little by including people who are not students. But for **ethical** reasons, you should stick to people you know (family, friends) rather than approach people on the street.

Ethical considerations

If you use the *Ways of coping* questionnaire to help you, think carefully about the ethical implications of some of the items. Most of them are likely to be acceptable to everyone, but some are fairly intrusive and perhaps sensitive. These are best avoided altogether. Asking people about stress always carries ethical risks, so you need to minimise these as much as possible. Gaining informed consent and offering the right to withdraw are very important protections for participants and should never be neglected.

Analysing your data

If you have taken the open question or semi-structured interview routes, then think about the **coding system** you will use to categorise your participants' responses into the two coping styles. Identify all the separate statements each participant has made. Decide whether they are more indicative of an emotion-focused or problem-focused style. Watch out for repetitive and duplicate statements (i.e. when a participant just says the same thing in a slightly different way). Categorise each participant according to whichever style is associated with the most comments.

Once you have 'scored' the questionnaire responses, you will know how many women and men prefer each style. You can then draw up a 2×2 **contingency table** with these figures in the four cells, calculating the row and column totals, as well as overall total. An appropriate statistical test could tell you whether there are significant differences in coping style between women and men.

The maths bit

Overall, at least 10% of the marks in assessments for Psychology will require the use of mathematical skills and this is included in the requirement that at least 25–30% in total will involve research methods.

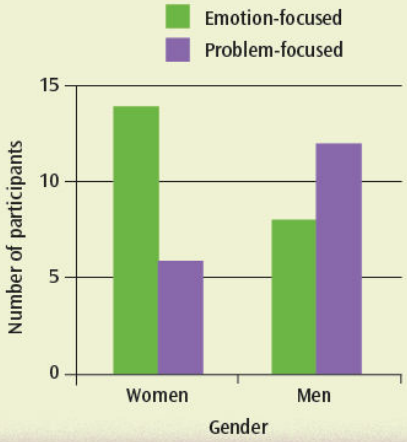
Don't avoid it!

Apply it Methods

The maths bit 2

1. Identify the type of graphical display shown below. (*1 mark*).
2. Use the data in the graph to draw an appropriate 2×2 **contingency table** of results. (*3 marks*)
3. Which **statistical test** would be most suitable to analyse the data? Explain your choice. (*1 mark + 2 marks*)
4. Apply the test you identified in question 3 to obtain a **calculated value**. State whether or not the result is **significant** and explain how you made this decision. (*1 mark + 3 marks*)
5. Outline *one* conclusion you can draw based on all the information you have available. (*3 marks*)

Graph showing number of participants preferring each coping style.



Revision summaries

The physiology of stress

How the body responds to stressors.

GAS

1. Alarm reaction – sympathetic ANS, fight or flight response.
2. Resistance – stress hormones depleted, parasympathetic conserves energy.
3. Exhaustion – resources depleted, stress-related illnesses.

Evaluation

Research support
Rats have same general response to various stressors (Selye).

GAS may not be general
Monkeys' responses were specific to the type of stressor (Mason).

Evaluation extra: Animal research
Same physiology in all mammals, but stress more complex in humans (e.g. cognitive appraisal).

Physiological stress response

Acute stress: SAM
Hypothalamus activates sympathetic ANS.
Adrenal medulla produces adrenaline. Liver releases glucose.
Stressor ends, parasympathetic branch initiates rest and digest.

Chronic stress: HPA
Hypothalamus releases CRF. Anterior pituitary releases ACTH.
Adrenal cortex releases cortisol (for energy).
Feedback – hypothalamus detects cortisol and inhibits response.

Evaluation

Real-world application
Knowledge of how cortisol and stress are linked has helped people with Addison's disease (self-administer hydrocortisone).

Cognitive appraisal
Participants watched gruesome film, heart rate high (stress) if it was an operation, low if an initiation rite (Speisman *et al.*).

Evaluation extra: What response?
Knowledge of fight or flight from studies of male animals, but response in females can also be tend and befriend (oxytocin).

The role of stress in illness

Cortisol and adrenaline have damaging effects.

Immunosupression

Chronic stressors lead to cortisol and suppress the immune system directly. Indirect effects through lifestyle choices.

Kiecolt-Glaser's research
Exams – 75 students, decrease in NK and killer T cells.
Caring for relative — weaker immune response, and more illness and depression.

Evaluation

Stress can be protective
Acute stressors enhanced the immune response in rats (Dharbhar).

Real-world application
Stress hormones before surgery (Dharbhar), relaxation training for exams (Kiecolt-Glaser and Glaser).

Evaluation extra: Research methods
Many studies are lab experiments (establish causation), but not like real-world situations.

Cardiovascular disorders (CVD)

Acute stress leads to adrenaline, direct and continuing effect on the heart.

Acute stress research
Acute stress of watching 1996 World Cup, more heart attacks when own team played (Wilbert-Lampen *et al.*).

Chronic stress research
Workplace stressors and life change stress both linked to MIs more than obesity (INTERHEART, Yusuf *et al.*).

Evaluation

Direct versus indirect effects
Marital stress increases risk of heart attack but not cause (Orth-Gomer *et al.*).

Research support
People with stress disorders had 64% greater risk of a CVD in first year after diagnosis, large sample (Song *et al.*).

Evaluation extra: What's the real cause?
Cause of CVDs could be physiological (stress triggers damaging response), or could be psychological (e.g. personality affects perception).

Sources of stress

Life changes

Major changes in our lives.

The explanation

What are life changes?
Major events that happen infrequently but need adjustment, positive or negative.

Life changes and illness
LCUs (SRRS) positively correlated with illness (Holmes and Rahe).

Rahe *et al.*'s research
US Navy personnel, LCU calculated over 6 months, +.118 correlation between LCUs and illness during tour of duty.

Evaluation

Research support
High level life changes predict asthma, prospective study (Lietzén *et al.*).
Counterpoint – 48% of participants had one or no life changes, daily hassles better predictors (Lazarus *et al.*).

Individual differences
Prediction of heart attacks from SRRS scores depended on subjective view of life changes (Byrne and White).

Positive and negative changes
Most stress measured by the SRRS is caused by negative life changes, not changes as such (Turner and Wheaton).

Evaluation extra: Issues of causation
Life changes may directly cause stress and poor health, but correlational with intervening variables (e.g. anxiety).

Daily hassles

It's the little things.

The explanation

What are daily hassles?
Small but frequent occurrences that add up until we have trouble coping.

Primary and secondary appraisal
Psychological appraisal – primary (how threatening is the event) and secondary (can we cope).

Hassles, uplifts and life changes
HSUP, life changes are distal sources of stress, hassles are proximal.

Kanner *et al.*'s research
Hassles better predictor of psychological symptoms than life changes.

Evaluation

Research support
Hassles strong predictor of work stress, e.g. illness (Ivancevich).
Counterpoint – research involved retrospective recall, hassles forgotten.

Individual differences
Psychological appraisal explains how people perceive stress differently (Lazarus *et al.*).

Correlation not causation
Link between hassles and stress may be indirect, third factor (e.g. depression).

Evaluation extra: Hassles versus life changes
Hassles make life changes seem worse, but life changes may be more stressful because they create more hassles.

Workplace stress

Workload and control.

The explanation

Job-demands control model
High workload can make us ill, but risk reduced if we control our work (Karasek).

Bosma *et al.*'s research
10,000 civil servants followed over 5 years. Workload did not predict CHD, but lack of job control did at all grades.

Johansson *et al.*'s research
Sawmill finishers (low control / high workload) higher stress hormone levels, illness and absenteeism than cleaners.

Evaluation

Cultural similarities
Chinese and American workers rated workload as third most stressful factor (Liu *et al.*).
Counterpoint – lack of job control stressful in individualist cultures (Györkös *et al.*).

Simplistic model
Stress depends on more than two factors (control and workload), perceptions matter.

Control may be stressful
Having job control stressful if low self-efficacy (Meier *et al.*).

Evaluation extra: Validity
Workplace studies high external validity, but natural experiments have confounding variables.

Measuring stress

How do we know when someone is stressed?

Self-report

Social readjustment rating scale
Measures adjustment to 43 life changes in terms of LCUs.

Hassles and uplifts scale
117 daily hassles – seven categories rated for severity on 3-point scale.
135 daily uplifts – events that are pleasurable rated for frequency.

Evaluation

Validity of self-report
Stress is personal, best way to measure is ask about experiences.
Counterpoint – most stressed people made most negative interpretations (Dohrenwend *et al.*), inflates test scores.

The contamination effect
Some SRRS/HSUP items (causes) overlap with symptoms, so scales reflect illness rather than predict it.

Evaluation extra: Subjective versus objective
Self-report is subjective but stress is too. Physiological is objective, but no unique link between states and stress.

Physiological

Skin conductance response
ANS sweating increases electrical conductance of skin.

Other physiological measures
Blood pressure, hormones (e.g. cortisol) in blood, urine and saliva.

Evaluation

Individual differences
Labiles produce more resting SCRs than stabiles.

Scientific measures
Physiological measures not affected by personal biases (e.g. social desirability), more scientific.

Individual differences in stress

Personality type

People with different personalities respond to stress in different ways.

The explanation

Type A and B personality
Type A competitive, time-urgent and hostile (Friedman and Rosenman).
Type B relaxed, tolerant, not in a hurry.

Friedman and Rosenman's research
Western collaborative group study: prospective, 70% of Type A men developed CHD after 8½ years.

Type C personality
'Pathological niceness', avoid conflict, suppress emotions (Temoshok).

Dattore *et al.*'s research
Repression of emotions predicted later cancer and less depression.

Evaluation

Real-world application
Type A heart attack survivors had lower death rates later than Type Bs, indicates behaviour change possible (Ragland and Brand).

Counterpoint – participants were men, gender bias so practical advice not so relevant to women.

Problems with Type A concept
Hostility component more important in WCGS men who died after 27 years (Carmelli *et al.*).

Contradictory Type C evidence
Type C/breast cancer link only in women under 50 years – inconsistent findings (Greer and Morris).

Evaluation extra: Type A and Type B
Types A/B are distinct but inconsistent links with stress/illness.

Hardiness

Hardy people are better at dealing with stress.

The explanation

Hardiness
Cognitive appraisal – perception of stress.
Commitment – throw oneself into activities with gusto.
Challenge – welcome stressful changes.
Control – make things happen rather than behave passively.

Kobasa's research
670 managers (men), some were resilient (no illness), scored high on 3 Cs.

Maddi's research
One-third of managers flourished during a major company reorganisation.

Evaluation

Real-world application
Successful candidates for US Army Special Forces were hardy (Bartone *et al.*).

Research support
Hardy students had lower blood pressure in stressful task, even lower with Type B (Contrada).

Counterpoint – poorly defined concept, only challenge linked to blood pressure.

Concept too broad
Just focus on control and maybe commitment (Hull *et al.*), challenge most important (Contrada).

Evaluation extra: Direct or indirect?
Direct benefits (lower physiological arousal), but perhaps indirect because hardy people are motivated to be healthier.

Managing and coping with stress

Drug therapy

Treat physiological symptoms.

The expanation

Benzodiazepines (BZs)
Reduce CNS physiological arousal.
Mode of action – GABA combines with postsynaptic receptors, reducing transmission and anxiety, BZs enhance GABA.

Beta blockers (BBs)
Inhibit arousal of the sympathetic NS.
Mode of action – BBs block beta-adrenergic receptors so can't be stimulated by stress response (adrenaline).

Evaluation

Research support for BZs
Review RCTs found BZs better than placebo in reducing acute anxiety (Baldwin *et al.*).

Research support for BBs
BBs reduce everyday physical symptoms e.g. exams (Kelly), better combined with BZs (Hayes and Schulz).

Counterpoint – causes not removed, short-term relief, masks deeper problems.

Side effects
BZs cause breathing problems and paradoxical reactions (Gaind and Jacoby), BBs can reduce blood pressure too much.

Evaluation extra: Costs and benefits
Costs include side effects and risk of dependency, but give short-term relief and help engage with psychological therapy.

Stress inoculation therapy

A cognitive-behaviour therapy.

The expanation

Phase 1 – Conceptualisation
Client and therapist identify stressors. Cognitive appraisal – learn to think differently and learn internal locus of control.

Phase 2 – Skills acquisition and rehearsal
Client learns skills, e.g. relaxation, coping self-statements.

Phase 3 – Real-life application and follow-through
Client applies skills in real life, prepare for setbacks (relapse prevention).

Duration of therapy
9 to 12 sessions of about an hour, one per week or over longer period.

Evaluation

Research support
Meta-analysis found SIT reduced all levels of stress and improved performance e.g. in exams (Saunders *et al.*).

A demanding therapy
Many new and challenging skills (e.g. coping self statements), so many ultimately drop out.

Counterpoint – also flexible, tailored to client (e.g. learning difficulties).

Overcomplicated
Control may be key, no success with asylum seekers lacking control (Hensel-Dittman *et al.*).

Evaluation extra: Quick fix versus slow fix
SIT is a 'slow fix' and longer-term benefits but drugs are 'quick fix' and require no effort from client.

Biofeedback

Learning to control ANS.

The explanation

Aims of biofeedback
Learn to control involuntary physiological responses using machine feedback e.g. EMG, EEG, skin conductance.

The training procedure
1. Awareness – introduction to feedback.
2. Learn control – using stress management techniques, success is rewarding (operant conditioning).
3. Transfer – practise in everyday situations.

Davis's research
25 women with breast cancer using biofeedback, lower cortisol and anxiety levels after eight months.

Evaluation

Research support
Biofeedback reduced perceived stress in medics over 28 days (Lemaire *et al.*).

Counterpoint – this study also found no effect on physiological measures.

Convenient therapy
Easy and cheap to use, e.g. small size of monitor, colourful, no supervision.

Challenging therapy
Not for everyone, need to understand link between physiology and signals, and be motivated to practise skills.

Evaluation extra: Just relax?
Operant conditioning reduces heart rate (no thinking), but relaxation also reduces it.

Gender differences

Women emotion-focused.

The explanation

Gender-related coping methods
Men use problem-focus (practical).
Women use emotion-focus (anxiety).
Research – infertile couples, men plan, women accept blame (Peterson *et al.*).

Tend and befriend
Fight or flight (men), tend and befriend (women), evolutionary (Taylor *et al.*).
Research – 25 out of 26 studies support (Luckow *et al.*), befriending mainly with other women (Lewis and Linder).

Oxytocin
Drives tend and befriend, linked to lower cortisol levels (Taylor *et al.*).

Evaluation

Emotion- and problem-focus
Study of infertile couples, hard to categorise strategy e.g. seeking help from others is both (Peterson *et al.*).

Research support
Meta-analysis of 26 studies, women more likely than men to use social support (Tamres *et al.*).

Counterpoint – females' response can be 'fight or flight', men's can be 'tend and befriend'.

Retrospective research
Recall of past coping may explain gender difference, disappears when concurrent method used (De Ridder).

Evaluation extra: Gender or stressor?
Gender differences biological (e.g. hormones), or different stressors (e.g. relationship-related)?

Role of social support

Hugs can reduce stress.

The explanation

Types of social support
Instrumental – practical (e.g. giving money).
Emotional – lift mood (e.g. express sympathy).
Esteem – help person value themselves.

Cohen *et al.*'s research
404 participants, greater perceived social support associated with less likely infection from cold virus.

Evaluation

Research support
Patients with melanoma given emotional and instrumental support had better NK cell count (Fawzy *et al.*).

Counterpoint – no benefit for recurrence at ten-year follow-up, small benefit in terms of survival.

Gender differences
Women use emotional support more and men use instrumental more (Luckow *et al.*).

Negative effects
Instrumental support from friend less reliable than from professionals, emotional support can be unhelpful.

Evaluation extra: Support versus hardiness
Support can directly benefit immune system, but negative effects and less beneficial than hardiness.

Practice questions, answers and feedback

Question 1 Outline what research has found about the role of stress in illness. (*4 marks*)

Morticia's answer *The classic study on stress and illness was conducted by Rahe* et al. *who looked at the relationship between stress and illness in thousands of men in the navy. They filled in the SRRS before they went on a tour of duty and during their 6-month tour of duty kept a record of any visits to the sick bay. This produced a small but significant correlation between life changes and health.* *Other research has looked at daily hassles and illness. For example, Kanner* et al. *used the Hassles scale and also the SRRS over a period of 9 months and found positive correlations with psychological problems. This was much stronger for hassles than life changes.*	Much of Morticia's account of the Rahe *et al.* study in the first paragraph is focused on procedure when the question asks for 'findings'. The correlation point is the only discernible finding. Morticia only provides a similarly brief reference to the findings in her second paragraph.
Luke's answer *Kiecolt-Glaser has conducted research on the relationship between immune functioning and stress. Stress leads to immunosuppression, i.e. stops the immune systems functioning as well. In one study on students they found that during a period of high stress (during exams) the students had lower levels of NK and killer T cells (components of the immune system) than when the students were less stressed (before exams). Lower levels of immune activity mean a person is more likely to be ill.* *Research has also looked at stress and cardiovascular disorders. Acute emotional stress was shown to be linked to heart attacks in a study of audience reaction during the World Cup. Incidences of heart attacks in Germany increased by 2.6 times when Germany was playing!*	Much more of a clear emphasis on findings in Luke's answer and the description is impressively detailed and accurate too.
Vladimir's answer *There is a lot of research on the relationship between stress and illness which is all correlational. For example, stress has been shown to suppress the immune system, though some research shows it may actually be immunoenhancing, i.e. being stressed may cause the immune system to function better. This seems to be the case for acute stressors rather than long-term ones. For example, in the case of injury, lymphocytes flood into injury sites.*	The main issue in Vladimir's answer is a lack of specific studies. The findings presented are quite general whereas particular details might have been better.

Question 2 Janet is considering leaving her teaching job as her anxiety means she often cannot sleep the night before a school day. She is reluctant to take drug treatment but has heard that stress inoculation therapy may help.

Briefly discuss how stress inoculation therapy may help reduce Janet's anxiety about teaching. (*8 marks*)

Morticia's answer *There are three steps in stress inoculation therapy (SIT). In the first step Janet would discuss her anxieties with the therapist so they can conceptualise what it is that is causing stress. In the second step Janet would be taught skills that might help her cope with the stress and in the third step she would practise these skills over a longer period. The aim is to provide her with long-term tools that would help her cope in future situations. This contrasts with drug treatments which are only helpful as long as you take them – though it might be good if she could reduce her anxiety for a while because she might gain her confidence back.*	The outline of SIT in Morticia's answer is just about sufficiently clear and detailed though there is minimal application. The final evaluative/contrasting point is relevant though a bit brief.
Luke's answer *The aspects of stress inoculation that would help Janet reduce her anxiety would first be to try to understand what aspects of teaching are creating anxiety. The therapist educates the client about the nature of stress and tries to convince the client that the solution lies in reconceptualising the problem as one that they can cope with.* *The therapist would then help Janet by selecting skills that would be of particular use for her. For example, learning relaxation skills might help her the night before school so she can sleep better. She could also learn coping self-statements to reduce her anxiety when in difficult situations.* *The therapist would offer continued support over time to stop Janet relapsing and going back to old habits. The therapist would consider what problems might crop up and work out solutions in advance.*	Luke's description of SIT is very clear and nicely applied, in fact rather more than is necessary here. Unfortunately, Luke seems to have overlooked the fact that evaluation was also required. Thus, his excellent explanation does not count as a high-level answer overall.
Vladimir's answer *Janet may be feeling worried about taking on stress inoculation therapy because it takes a lot of time and effort and she would prefer the quick fix that drugs offer her. Especially because she might just want to sleep better if that is all that is causing her problems. This means that, although stress inoculation therapy may be better, a lot of people don't actually use it because it requires a lot of time. Which ends up not making it a very effective therapy. A further issue is that it may be a very overcomplicated approach because evidence suggests that just taking more control may be all that is needed to reduce levels of anxiety. It is possible that in Janet's case though this approach would not be successful because some of her issues are not things she can actually control – and Hensel-Dittman et al. (2011) found that SIT was not useful in such situations. This again means the therapy overall is not suitable in some situations.*	Vladimir has engaged with the question stem about Janet and provided a well-informed discussion of the limitations of stress inoculation therapy. His answer would be complete if there had been a very brief outline of the therapy at the start.

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

Question 3 Describe **and** evaluate **two** methods of measuring stress. (*16 marks*)	
Morticia's answer *There are two main ways of measuring stress. One is to use self-report techniques where people are asked to describe their own stress and the other is to make direct physiological measurements.*	**A good, clear beginning.**
There are two well-known self-report scales. One of them is the SRRS (Social readjustment rating scale) devised by medical doctors Holmes and Rahe. They listed 43 important life changes such as divorce, birth of a child and Christmas. Each of these events requires readjustment and that creates stress. To measure how much stress a person is feeling Holmes and Rahe asked people to assign a value to each event using marriage as an arbitrary 500. They then worked out life change units for each event. To calculate stress a person is asked to indicate how many events have been experienced in the last year and then a total can be calculated.	**There is precise and detailed description of the first method throughout this second paragraph.**
The other self-report measure is the Hassles and uplifts scale (HSUP) devised by Kanner et al. This lists 117 hassles and 135 uplifts. A person rates each hassle on a scale of 1 to 3 to indicate severity. Again a total score is calculated by setting hassles against uplifts.	**As Morticia introduced these methods using the umbrella term, 'self-report methods' then any number of these are relevant.**
The main physiological measure is the skin conductance response. When you are stressed by something the autonomic nervous system is aroused, which results in sweating amongst other symptoms. This sweating enhances how much electricity can be conducted on the skin. To detect this, electrodes are placed on the skin. This is done when a person is not stressed (tonic conductance) or as a kind of baseline and then again when feeling stressed (phasic conductance). This way you can tell when someone is feeling stressed.	**In paragraph 4 a physiological measure is described – again, detailed and accurate – but Morticia needs to move on to evaluation soon if this essay is to have some balance.**
Of course, this assumes that a person does sweat when stressed because there are individual differences. Some people are stabiles who do not show much change when they feel stressed and other people are labiles who produce a lot of sweat even at rest.	**The final two paragraphs are evaluative. The last paragraph contains sustained, informed commentary but there is not enough of this overall.**
There have been quite a few criticisms of the self-report scales that mean they may lack validity. For example one issue is the built-in bias. This is because items like 'serious illness/injury' are quite general and can be interpreted in different ways. Stressed people interpret them very negatively so their scores are inflated. Also, there is the contamination effect because self-report scales are supposed to help predict illness. But they just reflect it instead because items overlap with symptoms. So scales may lack validity. **(404 words)**	**It would have been better to replace the material on the HSUP with evaluation in order to improve this extended response.**
Vladimir's answer *I am going to focus on two of the main methods used to measure stress, both of which are self-report measures. Most stress research uses the SRRS (Social readjustment rating scale) or the HSUP (Hassles and uplifts scale) which was developed after the SRRS because the researchers felt that life events are much rarer and don't apply to all people. Also stress is created on a daily basis. Research by Kanner does suggest that hassles are a better predictor of illness.*	**Vladimir's approach is to focus on two self-report methods, but it is just as legitimate as Morticia's.**
The SRRS is a checklist of 43 life events or life changes. These events were identified by Holmes and Rahe from studying the medical records of thousands of hospital patients and identifying the events in the patient's lives that happened not long before they became ill. Each event was not equivalent in terms of how stressful it was, for example, death of a spouse is more stressful than being fired at work. They worked out the stressfulness of each event by asking several hundred participants to rate each item in terms of how much readjustment would be needed to adapt to each of these changes. As a guide, the raters had to imagine that marriage was an arbitrary 500 units of life change. The scale is then used by asking a person to tick which events they have experienced over a period of usually one year and then the life change units for these events can be added up.	**A very detailed account is given of SRRS. Given the description-evaluation balance required a more concise descriptive summary would have been more appropriate, and like Morticia's answer above, this lengthy paragraph upsets the balance of the answer.**
One strength is that asking people about their experiences is a good way to measure stress because stress is about how you experience it. And people will also feel it makes sense to assess stress this way. However a major problem here is that people may interpret something like 'personal injury' quite differently from each other. One person may see it as something small for example a bruise, whereas another person sees it as a larger event. Altogether this threatens the validity of such scales and there is also social desirability to think about in self-report measures.	**Paragraph 3 does contain two clear evaluation points that are accurate and relevant.**
The HSUP scale was developed by Kanner. He asked colleagues to identify things that were daily hassles from seven categories such as work, health, family and friends and selected over 100 items. To rate stress a person is asked to rate each item in terms of how severe it is using a scale of 1–3. To balance hassles people were also asked about uplifts, which are also rated.	**A more focused description of the HSUP scale (perhaps because Vladimir is running out of time) but possibly better for it.**
Similar criticisms have been made about this scale as for the SRRS because some of the categories are vague. Also there is the question of whether it is actually better to use an objective measure of stress such as the skin conductance response which is more objective than a self-report scale – though, on the other hand it doesn't tell us to what extent someone is experiencing stress. We are assuming the physiology is the same as being stressed but people experience stress differently. **(489 words)**	**Again, relevant evaluation at the end but the overall answer – like the one before it – relies too heavily on description when a little more evaluation would have been ideal.**

Multiple-choice questions

The physiology of stress

1. **A feature of the resistance stage of the GAS is:**
   (a) Detection of a stressor by the hypothalamus.
   (b) Diseases of adaptation.
   (c) Depletion of the body's energy resources.
   (d) Activation of the fight or flight response.

2. **The sympathomedullary pathway involves:**
   (a) Stimulation of the anterior pituitary.
   (b) Release of ACTH.
   (c) Release of CRF.
   (d) Release of adrenaline.

3. **The hypothalamic-pituitary-adrenal system:**
   (a) Involves release of cortisol.
   (b) Is involved in acute stress.
   (c) Releases adrenaline into the bloodstream.
   (d) Involves activation of the ANS.

4. **The general adaptation syndrome may not be a general response because:**
   (a) The alarm reaction is always followed by resistance.
   (b) The resistance stage uses a lot of the body's energy.
   (c) It takes into account psychological factors.
   (d) The body responds in specific ways to specific stressors.

The role of stress in illness

1. **An example of a direct effect of stress on the immune system is:**
   (a) People smoke and drink more.
   (b) Cortisol suppresses lymphocyte production.
   (c) We exercise less.
   (d) Sleep patterns are disturbed.

2. **Kiecolt-Glaser *et al.* (1984) found that exam stress:**
   (a) Decreased activity of NK cells.
   (b) Was less damaging in students experiencing other stressors.
   (c) Had an indirect effect on the immune system.
   (d) Had less effect on students who were lonely.

3. **The best example of an acute stressor linked to cardiovascular disorder is:**
   (a) Having too much to do at work.
   (b) Changes in your relationships.
   (c) Caring for an ill person.
   (d) Sudden emotional arousal.

4. **Dharbhar's study showed that stress can have immunoenhancing effects because:**
   (a) Severe stress is not as damaging as once thought.
   (b) Lymphocytes do not respond to mild stressors.
   (c) Acute and chronic stressors have similar effects.
   (d) A mild stressor activates the immune system without causing damage.

Sources of stress: Life changes

1. **A life change is:**
   (a) One of those little things that just makes you stressed.
   (b) Something that affects everyone in the same way.
   (c) A relatively infrequent event.
   (d) Generally good for your health.

2. **Most research has found that:**
   (a) Life changes are strong predictors of illnesses.
   (b) A high life change unit score is associated with illness.
   (c) Positive life changes are just as stressful as negative ones.
   (d) Life changes cause illness.

3. **Rahe *et al.* found:**
   (a) A negative correlation between LCU and illness scores.
   (b) Only negative life changes were associated with illness.
   (c) A weak but significant correlation between LCU and illness scores.
   (d) LCUs are not useful predictors of illness.

4. **The life changes approach does not:**
   (a) Offer a means of assessing life changes.
   (b) Consider both positive and negative life changes.
   (c) Measure changes over time.
   (d) Consider that people perceive stressors differently.

Sources of stress: Daily hassles

1. **Daily hassles are stressful because their effects are:**
   (a) Unpredictable.
   (b) Cumulative.
   (c) Similar to life changes.
   (d) Controllable.

2. **Subjectively assessing the potential threat to our health of a hassle is an example of:**
   (a) Primary appraisal.
   (b) Secondary appraisal.
   (c) A distal source of stress.
   (d) The interaction between life changes and daily hassles.

3. **In Kanner *et al.*'s study, hassles were:**
   (a) Not valid sources of stress.
   (b) Negatively correlated with psychological symptoms.
   (c) Better predictors of illness than life changes.
   (d) Worse predictors than life changes.

4. **The main problem with retrospective research is:**
   (a) It is not applicable to real-world situations.
   (b) It relies on remembering the hassles from the past.
   (c) It is time-consuming and costly.
   (d) Many people drop out early.

Sources of stress: Workplace stress

1. **The most accurate statement of the job demands-control model is:**
   (a) Lack of job control is stressful.
   (b) Having too much control in a job is worse than having none.
   (c) Having job control buffers against the effects of workload.
   (d) The stress of having too much work causes illness.

2. **In Bosma *et al.*'s study:**
   (a) Workload was a significant predictor of illness.
   (b) Top grade civil servants were less likely to become ill.
   (c) Lack of job control was correlated with illness.
   (d) Competitive civil servants were more likely to become ill.

3. **Johansson *et al.*'s Swedish sawmill study found that:**
   (a) Cleaners had higher hormone levels than finishers before they got to work.
   (b) Both lack of control and high workload were associated with illness and absenteeism.
   (c) The finishers' stress hormone levels were higher than the cleaners' at the start of the day but gradually decreased.
   (d) Finishers and cleaners had similar levels of illness.

4. **Collectivist and individualist cultures differ because:**
   (a) Workload is viewed as less stressful in collectivist cultures.
   (b) Collectivist cultures emphasise personal rights.
   (c) Job control is seen as desirable in individualist but not collectivist cultures.
   (d) Workplace stress is not considered important in collectivist cultures.

Measuring stress

1. **A life change unit measures:**
   (a) How much stress is caused by the little annoyances of the day.
   (b) The small pleasures of everyday life.
   (c) Control over stressful events.
   (d) How much adjustment is needed to adapt to change.

2. **The Hassles scale measures:**
   (a) The frequency of life events.
   (b) The severity of daily hassles.
   (c) How much control we have over daily hassles.
   (d) Our physiological responses to daily hassles.

3. **The two types of skin conductance response are:**
   (a) Resting and active.
   (b) Tonic and phasic.
   (c) Resting and phasic.
   (d) Active and phasic.

4. **The contamination effect means that self-report scales:**
   (a) Predict illness.
   (b) Are valid.
   (c) Reflect illness.
   (d) Are reliable.

Individual differences in stress: Personality type

1. **A common trait of Type A people is:**
   (a) Tolerance.
   (b) Ambition.
   (c) Conflict avoidance.
   (d) Patience.

2. **A finding of the Western collaborative group study was:**
   (a) There were twice as many Type B people with CHD as Type A.
   (b) 70% of people with CHD were Type A.
   (c) Type A personality was not a risk factor for CHD.
   (d) Type B people had higher levels of adrenaline.

3. **Type C may be linked with cancer because:**
   (a) Type C people suppress their emotions.
   (b) Cancer is more common in people who are impatient.
   (c) Type C people are less likely to change lifestyle to avoid illness.
   (d) Type C people are hostile.

4. **The component of Type A most associated with CHD is:**
   (a) Competitiveness.
   (b) Time-urgency.
   (c) Hostility.
   (d) Emotional suppression.

Individual differences in stress: Hardiness

1. **Commitment is best described as:**
   (a) Welcoming change as an opportunity not a threat.
   (b) Actively influencing your environment.
   (c) Getting involved with life and squeezing every drop out of it.
   (d) Learning something new from stressful situations.

2. **Kobasa found that hardy managers:**
   (a) Scored lower on the Three Cs.
   (b) Were under less pressure than other managers.
   (c) Took less time off work ill.
   (d) Weren't bothered about losing their jobs.

3. **According to Hull *et al.*, which component(s) of hardiness should be retained?**
   (a) Commitment.
   (b) Challenge and control.
   (c) Challenge, commitment and control.
   (d) Control.

4. **Hardiness could benefit health indirectly because:**
   (a) It increases physiological stress on the body.
   (b) Hardy people are more likely to engage in healthy behaviours.
   (c) Hardy people avoid stressful situations.
   (d) Being hardy makes you better at ignoring stressors.

Managing and coping with stress: Drug therapy

1. **Benzodiazepines reduce anxiety by:**
   (a) Enhancing the activity of GABA.
   (b) Shutting down GABA-A receptors in the CNS.
   (c) Inhibiting the effects of adrenaline and noradrenaline.
   (d) Blocking chloride ions at the synapses.

2. **Beta blockers help people with anxiety because they:**
   (a) Act directly on the brain and cause sedation.
   (b) Help people perceive stressors in a different way.
   (c) Reduce physiological symptoms like racing heartbeat.
   (d) Increase a person's resistance to stressors.

3. **Benzodiazepines are beneficial in reducing anxiety because they:**
   (a) Have no side effects.
   (b) Are more convenient than beta blockers.
   (c) Do not create dependency.
   (d) Don't affect the brain so a person remains alert.

4. **Baldwin *et al.* reviewed studies that used:**
   (a) Randomised controlled trials.
   (b) Random control tests.
   (c) Randomly allocated tests.
   (d) Random allocation trials.

Managing and coping with stress: Stress inoculation therapy

1. **The three phases of stress inoculation therapy are:**
   (a) Conceptualisation, relaxation, follow-up.
   (b) Conceptualisation, practice, transfer.
   (c) Conceptualisation, skills acquisition, real-life application.
   (d) Conceptualisation, learning, restructuring.

2. **A feature of the conceptualisation phase of SIT is:**
   (a) Client learns techniques for coping with stress.
   (b) Client learns to overcome stressors by thinking about them differently.
   (c) Therapist gives the client opportunities to practise their coping skills.
   (d) Client prepares to accept setbacks.

3. **SIT is useful in managing stress because:**
   (a) We just have to take control of stressful situations.
   (b) Sometimes the only thing we can change is ourselves.
   (c) We want an easy solution.
   (d) The therapist tells us what to do.

4. **SIT is flexible because:**
   (a) It can be adapted to suit individuals.
   (b) It even uses drugs to reduce stress.
   (c) The client doesn't have to put a lot of effort into it to get results.
   (d) Everybody benefits from it.

Managing and coping with stress: Biofeedback

1. **Biofeedback works by:**
   (a) Reducing the amount of stress people experience.
   (b) Changing the way that people think about stressors.
   (c) Helping clients to learn to control their involuntary functions.
   (d) Helping us avoid stressful situations.

2. **An important step in biofeedback training is to:**
   (a) Accept stressors as challenges rather than threats.
   (b) Transfer what you have learned to everyday life.
   (c) Collaborate with the therapist to identify stressful situations.
   (d) Become aware of how you think about stress.

3. **The effectiveness of biofeedback depends on:**
   (a) The gender of the therapist.
   (b) The patient's reaction to side effects.
   (c) How you measure the outcome of treatment.
   (d) The cost of the equipment.

4. **Biofeedback is:**
   (a) More effective than any other method of managing stress.
   (b) More convenient than using drugs.
   (c) Not effective in improving someone's psychological state.
   (d) Challenging because it requires high levels of motivation.

Managing and coping with stress: Gender differences

1. **The best example of problem-focused coping is:**
   (a) Throwing yourself into work to distract yourself.
   (b) Telling yourself everything's going to be OK.
   (c) Telling a friend all your troubles.
   (d) Checking websites to find out how to handle stress better.

2. **An example of tending and befriending is:**
   (a) Ringing a friend for a chat.
   (b) Having an argument.
   (c) Drowning your sorrows.
   (d) Running away very fast.

3. **Oxytocin:**
   (a) Reduces the stress response in males more than in females.
   (b) Is inhibited by female sex hormones.
   (c) Promotes social bonding.
   (d) Increases levels of cortisol in the bloodstream.

4. **Women generally:**
   (a) Are more likely to seek social support than men.
   (b) Use problem-focused coping more than men.
   (c) Have a stronger physiological response than men.
   (d) Are not as good at coping with stress as men are.

Managing and coping with stress: The role of social support

1. **An example of esteem support is:**
   (a) Answering the phone when a friend calls you at 3 a.m.
   (b) Telling someone they're really good at something.
   (c) Insisting your friend goes out to a party with you.
   (d) Paying for your friend to go on holiday with you.

2. **What do the three types of social support have in common?**
   (a) They all cost money.
   (b) They can all be given without the supporter being present.
   (c) They involve strong emotions.
   (d) They all involve practical help.

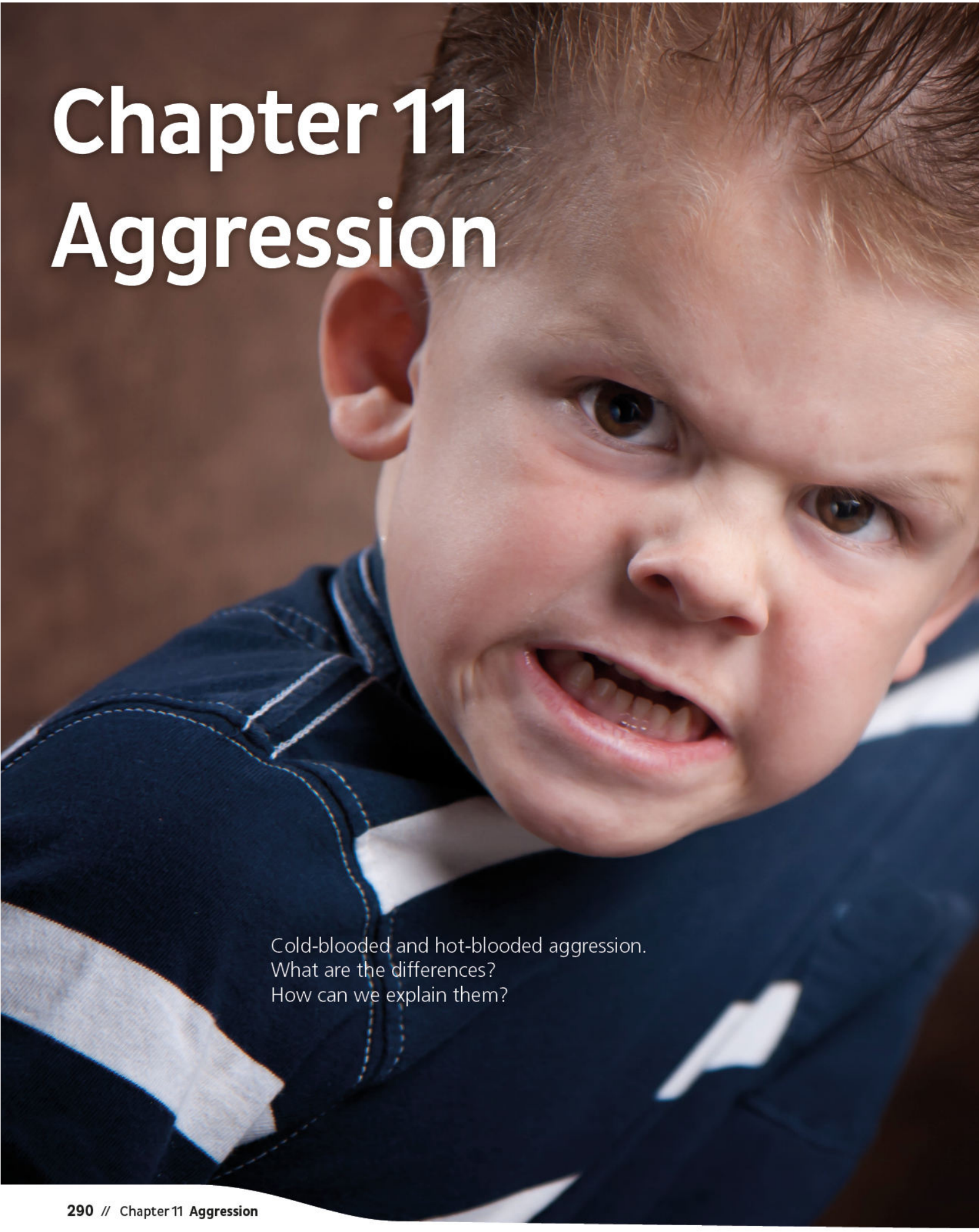
3. **Cohen *et al.* showed that a good way of communicating social support is through:**
   (a) Saying 'pull your socks up'.
   (b) Hugs.
   (c) Kisses.
   (d) Spending a lot of money.

4. **Social support can have negative effects because:**
   (a) People don't know what's good for them.
   (b) It can be expensive.
   (c) It may make a person more anxious.
   (d) Experts don't always know best.

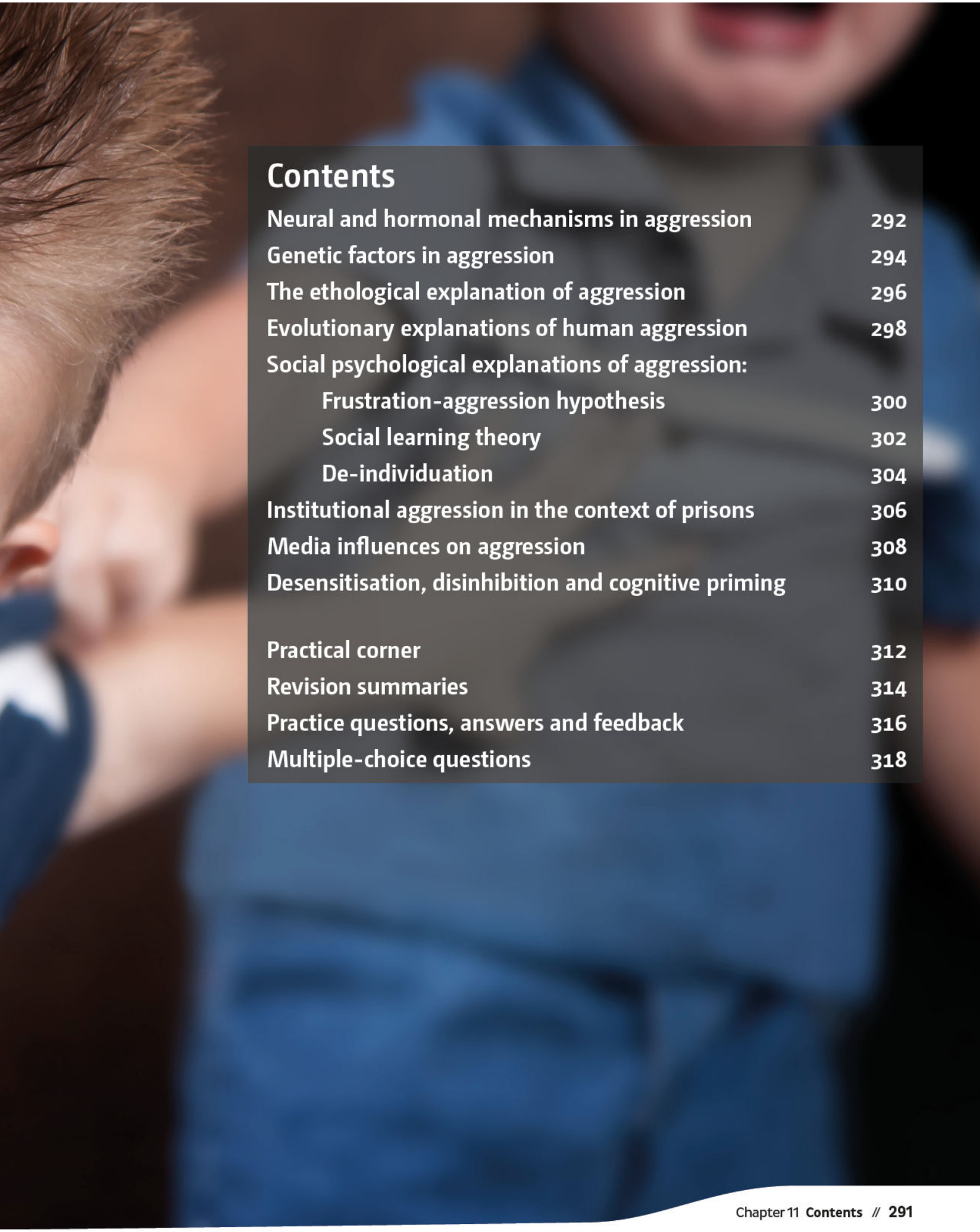
MCQ answers

The physiology of stress 1C, 2D, 3A, 4D
The role of stress in illness 1B, 2A, 3D, 4D
Sources of stress: Life changes 1C, 2B, 3C, 4D
Sources of stress: Daily hassles 1B, 2A, 3C, 4B
Sources of stress: Workplace stress 1C, 2C, 3B, 4C
Measuring stress 1D, 2B, 3B, 4C
Individual differences in stress: Personality type 1B, 2B, 3A, 4C
Individual differences in stress: Hardiness 1C, 2C, 3D, 4B
Managing and coping with stress: Drug therapy 1A, 2C, 3D, 4A
Managing and coping with stress: Stress inoculation therapy 1C, 2B, 3B, 4A
Managing and coping with stress: Biofeedback 1C, 2B, 3C, 4D
Managing and coping with stress: Gender differences 1D, 2A, 3C, 4A
Managing and coping with stress: The role of social support 1B, 2B, 3B, 4C

Chapter 11 Aggression



Cold-blooded and hot-blooded aggression.
What are the differences?
How can we explain them?



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Neural and hormonal mechanisms in aggression

The specification says...

> Neural and hormonal mechanisms in aggression, including the roles of the limbic system, serotonin and testosterone.

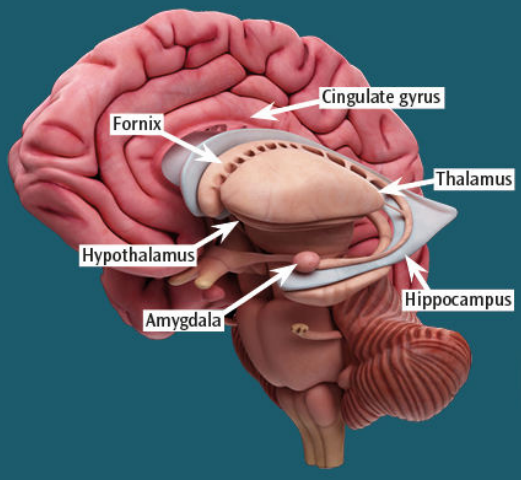
What do we mean by aggression? This question has created endless controversy, but one way of understanding it is in terms of two types of behaviour. What psychologists call *proactive aggression* is 'cold-blooded', a planned method of getting what you want. *Reactive aggression* is commonly understood as 'hot-blooded', it is angry and impulsive, and accompanied by physiological arousal. It is this type of aggression that psychologists have been most interested in, because it is probably responsible for a greater proportion of social problems. The spreads in this chapter cover a wide selection of explanations. On this one, we begin to consider the biological underpinnings of aggression.

Key terms

Limbic system Subcortical structures in the brain (including the hypothalamus and amygdala) thought to be closely involved in regulating emotional behaviour including aggression.

Serotonin A neurotransmitter with widespread inhibitory effects throughout the brain. It has a key role in aggressive behaviour.

Testosterone A hormone from the androgen group that is produced mainly in the male testes (and in smaller amounts in the female ovaries). Associated with aggressiveness.



The limbic system is made up of several subcortical structures, of which the amygdala is most closely associated with aggression.

Neural mechanisms in aggression

The limbic system

James Papez (1937) and Paul Maclean (1952) linked the **limbic system** to emotional behaviours, including aggression. They defined the limbic system as the **hypothalamus**, **amygdala** and parts of the **hippocampus** (plus other structures, see diagram below left). The reactivity of the amygdala in humans and other mammals is an important predictor of aggressive behaviour (i.e. the more responsive the amygdala, the more aggressive a person is). So the amygdala has a key role in how mammals assess and respond to environmental threats.

This amygdala activity is illustrated in a study by Katarina Gospic *et al.* (2011) where some participants were subjected to mild provocation. When participants reacted aggressively **fMRI** scans showed a fast and heightened response by the amygdala. A **benzodiazepine** drug (which reduces arousal of the **autonomic nervous system**) taken before the provocation led to two effects: it decreased the activity of the amygdala and halved the number of rejections (i.e. reduced aggression), illustrating again the role of the amygdala.

Orbitofrontal cortex and serotonin

Serotonin is a **neurotransmitter** that has widespread inhibitory effects in the brain, i.e. it slows down and calms neuronal activity.

Normal levels of serotonin in the **orbitofrontal cortex** (OFC) are linked with reduced firing of neurons, which in turn is associated with greater behavioural self-control. Decreased serotonin (deficiency) disrupts this mechanism, reducing self-control and leading to an increase in impulsive behaviour including aggression (Denson *et al.* 2012).

Matti Virkkunen *et al.* (1994) compared levels of a serotonin breakdown product (a metabolite called *5-HIAA*) in the cerebrospinal fluid of violent impulsive and violent non-impulsive offenders. The levels were significantly lower in the impulsive offenders.

Hormonal mechanisms in aggression

Testosterone

The male sex hormone **testosterone** is an **androgen** responsible for the development of masculine features. It is thought to be linked to aggressive behaviour for several reasons. Many people (not just researchers) have observed that men are generally more aggressive than women. Men become more aggressive towards other men at a time in development (after age 20 years) when testosterone levels are highest (Daly and Wilson 1988). Testosterone has a role in regulating social behaviour via its influence on certain areas of the brain implicated in aggression.

Castration studies of animals show that removing the testes (the source of testosterone) reduces aggression in the males of many species. Giving injections of testosterone to the same animals restores aggressive behaviour (e.g. Giammanco *et al.* 2005).

Some evidence for a similar association in humans comes from studies of prison populations, for example violent offenders. Mairead Dolan *et al.* (2001) found a **positive correlation** between testosterone levels and aggressive behaviours in a sample of 60 offenders (men) in UK maximum security hospitals. These men mostly had personality disorders (such as **psychopathy**) and histories of impulsively violent behaviour.

Progesterone

There is some evidence that **progesterone** (a female ovarian hormone) plays an important role in aggression in women. Levels of progesterone vary during the ovulation cycle and are lowest during and just after menstruation. Anna Ziomkiewicz *et al.* (2012) found a **negative correlation** between progesterone levels and self-reported aggression. This suggests that low levels of progesterone are linked to increased aggression in women.

Apply it Concepts — Flora

Flora is an eight-year-old girl whose parents have been called in to her primary school to see the head teacher. Flora is in trouble because she has been biting other children, one so badly he had to have hospital treatment. Flora doesn't seem to be able to control herself, even when she's not being aggressive she sometimes behaves in dangerous ways. Only last week she tried to climb onto the school roof.

Question

Explain Flora's aggressive behaviour in terms of neural mechanisms involving the limbic system and serotonin.

Evaluation

Other brain structures

One limitation of the limbic explanation is more recent research showing that non-limbic brain structures are also involved in aggression.

Limbic structures (e.g. the amygdala) function together with the orbitofrontal cortex (OFC), which is not part of the limbic system. The OFC is involved in impulse regulation and inhibition of aggressive behaviour. According to Emil Coccaro *et al.* (2007), OFC activity is reduced in those psychiatric disorders that feature aggression. This reduced activity disrupts the OFC's impulse-control function, which in turn causes aggressive behaviour.

This shows that the neural regulation of aggression is more complex than theories focusing on the amygdala suggest.

Drugs and serotonin

One strength of the serotonin explanation is research into the effects of drugs.

Drugs (e.g. *paroxetine*) that increase serotonin have been found to also reduce levels of aggressive behaviour. Mitchell Berman *et al.* (2009) gave participants either a placebo or a dose of *paroxetine*. The participants then took part in a lab-based game that involved giving and receiving electric shocks in response to provocation (e.g. insults). The *paroxetine* group consistently gave fewer and less intense shocks than the placebo group.

This study is evidence of a *causal* link between serotonin function and aggression.

Evaluation eXtra

Direct or indirect?

There is an argument that neural factors are directly linked to aggression. There is evidence to support this view in Gospic *et al.*'s (facing page) study of amygdala reactivity and benzodiazepines. Serotonin also reduces aggression by inhibiting neuronal activity.

However, the role of neural factors may be indirect. For example, Thomas Denson *et al.* (facing page) found a link between serotonin and aggression. But this is an indirect link because other factors (e.g. social, psychological) may influence it.

Consider: *To what extent can neural factors explain aggression?*

Evaluation

Animal research

One strength of hormonal explanations is support from research with non-human animals.

Marco Giammanco *et al.*'s (2005) review of studies confirms the role of testosterone. For example, in male rhesus macaque monkeys there is an increase in both testosterone levels and aggressive behaviour during the mating season. In rats, castration of males reduces testosterone and also mouse-killing behaviour. Injecting female rats with testosterone increases mouse-killing.

These findings show the role of testosterone in a range of animal species.

Dual-hormone hypothesis

One limitation is mixed evidence of the link between testosterone and aggression in humans.

Justin Carré and Pranjal Mehta (2011) developed a dual-hormone hypothesis to explain why. They claim that high levels of testosterone lead to aggressive behaviour but only when levels of **cortisol** are low. When cortisol is high, testosterone's influence on aggression is blocked. The hormone cortisol plays a central role in the body's response to chronic stress (see page 256).

Therefore the combined activity of testosterone and cortisol may be a better predictor of aggression than either hormone alone.

Evaluation eXtra

Animal research

Hormonal mechanisms involved in aggression in humans and other mammals are likely to be very similar. In fact the research on this spread shows that a lot of what we know about the role of hormones comes from non-human studies.

However, aggressive behaviour in humans is more complex than in other mammals. For example, Carré and Mehta's findings concerning cortisol applied only to human aggression. Also, cognitive factors play a greater role in human aggression, especially in 'cold-blooded' proactive aggression.

Consider: *To what extent can animal studies help us understand human aggression?*



Apply it Concepts

Angry young man

Benedict is a young man of 16 who has been involved in antisocial behaviour since he was at primary school. He seems to be getting worse. He easily gets into fights, even with men who are much bigger than him. He reacts very angrily when he thinks people are looking at him or talking about him. He has recently been arrested by the police for seriously assaulting an elderly man.

Question

Use what you know about the role of testosterone in aggression to explain Benedict's behaviour.

Apply it Methods

Testing testosterone

A psychologist wanted to investigate hormonal factors in aggressive behaviour. He decided to compare testosterone levels in two groups of offenders. One group consisted of men who had committed crimes involving direct physical assault. The other group was made up of men who had committed fraud. The psychologist measured testosterone levels of each offender by taking saliva samples.

Questions

1. Identify the operationalised **independent variable** and **dependent variable**. (*1 mark + 1 mark*)
2. Name the **experimental design** in this study and explain *one* strength and *one* limitation of this design. (*1 mark + 2 marks + 2 marks*)
3. Explain what is meant by the term **validity**. (*2 marks*)
4. Explain why this study might lack validity. (*3 marks*)

Check it

1. Outline the roles of the limbic system **and** serotonin in aggression. *[6 marks]*
2. Outline research into the role of neural **or** hormonal mechanisms in aggression. *[6 marks]*
3. Discuss the role of neural **and/or** hormonal mechanisms in aggression. *[16 marks]*

Genetic factors in aggression

The specification says...

Genetic factors in aggression, including the MAOA gene.

To understand the role of genetic factors in aggression, we have to try and disentangle these influences from those of the environment. Psychologists have several methods for doing this. These include twin studies, adoption studies and techniques for investigating the important role of one particular gene, the MAOA gene.

Key terms

Genetic factors Genes consist of DNA strands. DNA produces 'instructions' for general physical features of an organism (such as eye colour, height) and also specific physical features (such as neurotransmitter levels and size of brain structures). These may impact on psychological features (such as intelligence and mental disorder). Genes are transmitted from parents to offspring, i.e. inherited.

MAOA gene The gene responsible for the activity of the enzyme monoamine oxidase in the brain. The low-activity variant of the gene is closely associated with aggressive behaviour.



Identical twins – perfect for studying the contributions of genetic and environmental factors to aggressive behaviour.

Study tip

Biological-related topics like this one are challenging for many students. Getting your head around the specialist technical terms like monoamine oxidase A gene can be a struggle, but it's worth it. So by all means use initials e.g. MAOA (or *5-HIAA* from the previous spread). Remember that these terms are just words for you to learn, like lots of other words in all A level subjects. The glossary of terms in the back of this book should help you hugely in this.

Genetic factors in aggression

Twin studies

Several **twin studies** have suggested that **heritability** (i.e. genetic factors) accounts for about 50% of the variance in aggressive behaviour. For example, Emil Coccaro *et al.* (1997) studied men who were either **monozygotic** (MZ) or **dizygotic** (DZ) twins. Because MZ twins share 100% of their genes but DZ twins share only 50% (on average), we would expect to find greater similarities in aggressive behaviour between MZ twins if aggression is mostly influenced by genetic factors. This is because both MZ and DZ twins are raised together in the same environment, but MZ twins have a greater degree of genetic similarity than DZs. For aggressive behaviour defined as direct physical assault, the researchers found **concordance rates** of 50% for MZ twins and 19% for DZs. The corresponding figures for verbal aggression were 28% (MZs) and 7% (DZs).

Adoption studies

Similarities in aggressive behaviour between an adopted child and their biological parents suggest that genetic influences are operating. Similarities between an adopted child and their adoptive parents suggest that environmental influences are operating.

Soo Rhee and Irwin Waldman (2002) carried out a **meta-analysis** of **adoption studies** of direct aggression and antisocial behaviour, a prominent feature of which is aggressive behaviour. They found that genetic influences accounted for 41% of the variance in aggression, more or less in line with findings from twin studies.

The MAOA gene

The **MAOA gene** controls the production of an enzyme called *monoamine oxidase A* (MAO-A, note the gene is MAOA and the enzyme is MAO-A). MAO-A regulates the **neurotransmitter serotonin** (a monoamine). As we saw on the previous spread, serotonin is thought to play an important role in impulsive aggression.

Genes come in different variants (high and low in the case of the MAOA gene). The low-activity variant (MAOA-L) results in low activity of the MAO-A enzyme (MAO-A deficiency). It is this MAOA-L variant that has been linked to high levels of aggressive behaviour.

The MAOA gene has been nicknamed 'warrior gene' because of research by Rod Lea and Geoff Chambers (2007) which showed that the MAOA-L variant was possessed by 56% of New Zealand Maori men (compared with 34% of Caucasians). Historically, the Maori people have had a reputation for being ferocious warriors, hence the nickname.

The link between MAOA-L and aggression was further cemented by Han Brunner *et al.* (1993). They studied 28 men from a large Dutch family who were repeatedly involved in impulsively aggressive violent criminal behaviours such as rape, attempted murder and physical assault. These men had abnormally low levels of the enzyme MAO-A as well as the MAOA-L gene variant (which is sometimes referred to as the 'Brunner syndrome').

Gene-environment (G×E) interactions

Genes are crucial influences on aggressive behaviour but they do not function in isolation. It appears to be the case that MAOA-L gene activity is only related to adult aggression when combined with early traumatic life experiences.

For example, Giovanni Frazzetto *et al.* (2007) found an association between higher levels of antisocial aggression and the MAOA-L gene variant in men, as expected. But this was only the case in those who had experienced significant trauma (such as sexual or physical abuse) during the first 15 years of life. Those who had not experienced such childhood trauma did not have particularly high levels of aggression as adults, even if they possessed the MAOA-L variant. This is strong evidence of a gene-environment interaction (sometimes described as **diathesis-stress**).

Apply it

Concepts

Baz's aggressive kids

Baz has three children in their teens, and all of them seem to behave quite aggressively. They have all been in trouble at school for getting into fights. They take after their mother, who has a criminal record for assault. Baz's father was also a very aggressive person who spent time in prison for seriously assaulting a teacher. Baz is worried that aggression runs in families and is concerned how his grandchildren – if he ever has any – will turn out.

Question

Using your knowledge of genetic factors in aggression, explain whether Baz is right to be concerned.

Evaluation

Research support

One strength is support for the role of the MAOA gene in aggression.

Research on the facing page shows that the low-activity variant of the MAOA (MAOA-L) gene is associated with greater aggression. Vanessa Mertins *et al*. (2011) found that the converse is also true. Men with low-activity and high-activity variants of the MAOA gene took part in a money-distributing game. Men with the high-activity variant (MAOA-H) were more co-operative and made fewer aggressive moves than the low-activity participants.

This finding supports the relationship between MAOA gene activity and aggression.

Counterpoint However, the study by Mertins *et al*. also showed than non-genetic factors are crucial. They found that even participants with the low-activity MAOA variant (MAOA-L) behaved co-operatively rather than aggressively when they were made aware that others in the study were behaving co-operatively (i.e. giving away money). Knowledge of a social norm partly determined how aggressive or co-operative MAOA-L participants were.

Therefore genes are influenced by environmental factors (knowing about others' behaviour) that are at least as important in aggression.

Complex link

One limitation of the MAOA-serotonin-aggression link is that the precise mechanism is unclear.

On the previous spread, research linked aggression with low levels of serotonin (e.g. Virkkunen *et al*. 1994). But the MAOA-L gene causes low activity of the MAO-A enzyme which in turn should lead to higher serotonin – because the low-activity enzyme does not deactivate serotonin (its normal function), leaving more serotonin for synaptic transmission. In people with the MAOA-L variant, it may be more accurate to say that their serotonin levels are disrupted rather than they are lower or higher than normal.

This shows that the relationship between the MAOA gene, serotonin and aggression is not yet fully understood.

Problems with twin studies

Another limitation of the genetic explanation is that twin studies may lack **validity**.

In every pair of twins, both individuals share the same environment as each other (because each pair is raised together). However, DZ twins may not share their environment to the same extent that MZ twins share theirs. We assume they do and this is called the *equal environments assumption*. But the assumption may be wrong because one aspect of the environment is the way twins are treated by others. MZ twins are treated very similarly, especially by parents (e.g. praising them equally for being aggressive). DZs are treated in less similar ways.

This means that concordance rates are inflated and genetic influences on aggression may not be as great as twin studies suggest.

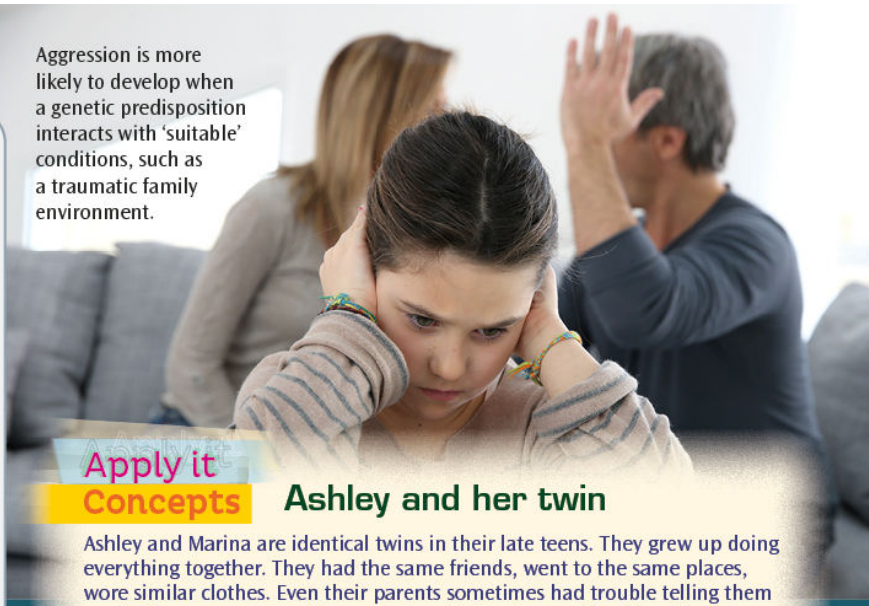
Evaluation eXtra

Nature and nurture

Several lines of evidence on this spread point to genes as direct causes of aggression. These include twin and adoption studies, research on the MAOA gene and animal studies.

However, there is also evidence that environmental factors are important. Criticisms of twin studies support this view. Early childhood trauma also plays a role. At the very least environmental factors affect whether or not genes are expressed.

Consider: *Do genes or environment make the more important contribution to aggression?*



Aggression is more likely to develop when a genetic predisposition interacts with 'suitable' conditions, such as a traumatic family environment.

Apply it Concepts — Ashley and her twin

Ashley and Marina are identical twins in their late teens. They grew up doing everything together. They had the same friends, went to the same places, wore similar clothes. Even their parents sometimes had trouble telling them apart. Everyone who met them commented on how polite, friendly and happy they both were. But a few years ago, Marina was involved in a serious car accident. The physical scars are healing, but she seems like a different person. She is much more irritable, and quite aggressive, even sometimes physically so. She's very different from her twin sister these days.

Question

Use your knowledge of the role of genetic factors and G×E interactions to explain why Marina's behaviour has changed.

Apply it Methods — Ultimatum time

A researcher investigating the genetics of aggression divided a sample of participants into two groups: those with the low-activity variant of the MAOA gene, and those with the high-activity variant. Each participant played as the Responder in the *Ultimatum Game*, in which a Proposer suggested how £20 should be split between them. Half of the high-activity and half of the low-activity participants were made a fair offer (£10 each) and the other half were made an unfair offer (only £5 for them). The Responders could reject or accept the offer. The researcher defined an unfair offer as a provocation, and defined a rejection as an aggressive act. The results of the study are shown below.

Table showing number of rejections made by low- and high-activity participants to fair and unfair offers.

	Low-activity gene	High-activity gene
Fair offer (unprovoked)	9	12
Unfair offer (provoked)	16	7

Questions

1. With reference to these figures, outline what the findings of the study seem to show. (*2 marks*)
2. Identify an appropriate **statistical test** the researcher could use to analyse the data. (*1 mark*)
3. Give *two* reasons why this would be an appropriate test to use. (*2 marks*)
4. Draw a suitable graph to represent this data. Identify the type of graph you have drawn. (*3 marks + 1 mark*)

Check it

1. Outline the role of genetic factors in aggression. *[6 marks]*
2. Explain **one** limitation of research on the role of genetic factors in aggression. *[4 marks]*
3. Explain the role of the MAOA gene as a genetic factor in aggression. *[4 marks]*
4. Discuss the role of genetic factors in aggression. *[16 marks]*

The ethological explanation of aggression

The specification says...

> The ethological explanation of aggression, including reference to innate releasing mechanisms and fixed action patterns.

Ethology is the study of animal behaviour in natural settings. Konrad Lorenz (1966), the founder of ethology, defined aggression as '...the fighting instinct in beast and man which is directed against members of the same species'. This definition reveals two key elements of the ethological approach:

Aggression is an instinct. It occurs in all members of a species without the need for learning. It is innate and mostly genetically determined.

Ethologists study aggression in non-human animals and extrapolate their findings to humans because we are all subject to the same forces of natural selection (Darwin 1859).

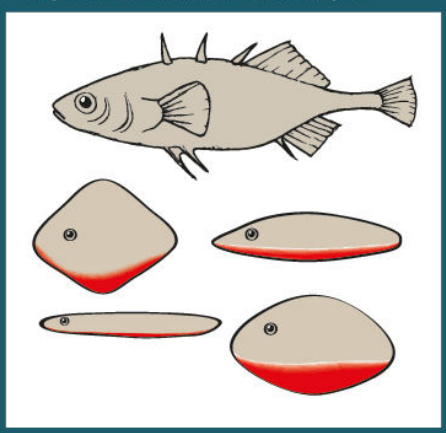
Key terms

Ethological explanation An explanation that seeks to understand the innate behaviour of animals (including humans) by studying them in their natural environments.

Innate releasing mechanism (IRM) A biological structure or process (e.g. in the brain) which is activated by an external stimulus that in turn triggers a fixed action pattern.

Fixed action pattern (FAP) A sequence of stereotyped preprogrammed behaviours triggered by an innate releasing mechanism.

Tinbergen's stickleback models. A realistically shaped model (top) did not provoke aggressive behaviour because it lacked a red underbelly. All the other models did provoke aggression, despite their unstickleback-like shapes.



The ethological explanation of aggression

Adaptive functions of aggression

The **ethological explanation** suggests that the main function of **aggression** is **adaptive**. Aggression is beneficial to survival because a 'defeated' animal is rarely killed (see below), but rather is forced to establish territory elsewhere. This means that members of a species spread out over a wider area and have to discover resources in a different place, which reduces competition pressure and the possibility of starvation.

Another adaptive function of aggression is to establish dominance hierarchies. Male chimpanzees use aggression to climb their troop's social hierarchy. Dominance gives them special status (e.g. mating rights over females). This happens in humans too. Gregory Pettit *et al.* (1988) studied groups of young children and observed how aggression played an important role in the development of dominance hierarchies. This would be adaptive (and thus **naturally selected**) because dominance over others brings benefits such as access to resources (e.g. food and mates).

Ritualistic aggression

A ritual is a series of behaviours carried out in a set order. Konrad Lorenz (1966) observed that fights between animals of the same species produced little actual physical damage. Most aggressive encounters consisted of a prolonged period of ritualistic signalling (e.g. displaying claws and teeth, facial expressions of threat).

Furthermore, Lorenz pointed out that intra-species aggressive confrontations end with ritual appeasement displays. These indicate acceptance of defeat and inhibit further aggressive behaviour in the victor, preventing any damage to the loser. For instance, at the end of an aggressive confrontation a wolf will expose its neck to the victor, a submissive appeasement gesture making itself vulnerable to a single bite to its jugular vein. This is adaptive because if every aggressive encounter ended with the death of one of the combatants, that could threaten the existence of the species.

Innate releasing mechanisms and fixed action patterns

An **innate releasing mechanism** (IRM) is an inbuilt physiological process or structure, for instance a network of **neurons** (a circuit) in the brain. An environmental stimulus (such as a certain facial expression) triggers the IRM which then 'releases' a specific sequence of behaviours. This behavioural sequence is called a **fixed action pattern** (FAP). According to Stephen Lea (1984), FAPs have six main features:

- Stereotyped, or relatively unchanging sequences of behaviours.
- Universal, because the same behaviour is found in every individual of a species.
- Unaffected by learning, the same for every individual regardless of experience.
- 'Ballistic', once the behaviour is triggered it follows an inevitable course and cannot be altered before it is completed.
- Single-purpose, the behaviour only occurs in a specific situation and not in any other.
- A response to an identifiable specific sign stimulus (or, if it involves communication between members of the same species, it is known as a *releaser*).

Tinbergen's research

Procedure Male sticklebacks are highly territorial during the spring mating season, when they also develop a red spot on their underbelly. If another male enters their territory, a sequence of highly-stereotyped aggressive behaviours is initiated (FAP). The *sign stimulus* (the particular feature of a stimulus) that triggers the innate releasing mechanism is the sight of the red spot. Niko Tinbergen (1951) presented sticklebacks with a series of wooden models of different shapes.

Findings Regardless of shape, if the model had a red spot the male stickleback would aggressively display and even attack it. But if there was no red spot, there was no aggression, even if the model looked realistically like a stickleback (see left). Tinbergen also found that these aggressive FAPs were unchanging from one encounter to another. Once triggered, the FAP always ran its course to completion without any further stimulus.

Apply it Concepts — Lars, Elvis and Bungee

Lars has two pet dogs called Elvis and Bungee. The dogs have lived together for a while now and get on well, but in the early days they used to fight a lot. Elvis always seemed to be the most aggressive. He would bare his teeth and growl at Bungee, who would half-heartedly respond by waving a paw in Elvis's general direction, before rolling over and showing his belly. Funnily enough, they never seemed to really go for it badly enough to hurt each other.

Question

Use your knowledge of the ethology of aggression to explain Elvis's and Bungee's behaviour.

Practical activity on page 312

Evaluation

Research support

One strength is support from research related to **genetics** and evolution.

On the previous spread we considered evidence that supports a genetic basis for aggression. For example, Han Brunner *et al.*'s study (1993) showed that one gene (the MAOA-L gene) is closely associated with aggressive behaviour in humans. **Twin** and **adoption studies** also showed that there is a **significant** genetic component to aggression in humans. Furthermore, on the next spread we look at the case for seeing aggression as an adaptive behaviour (e.g. Wilson and Daly 1996) and therefore genetically-based. These lines of research point towards an innate basis to aggressive behaviour.

This suggests the ethological approach is correct in claiming that aggression is genetically determined, heritable and adaptive.

Counterpoint However, aggressive behaviour differs from one culture to another, sometimes even within the same country. Richard Nisbett (1993) found that one type of homicide (the result of reactive aggression) was more common amongst white men in the southern United States than in the northern states. Reactive aggression is a response to threats from someone else. Nisbett concluded that the difference was caused by a 'culture of honour' in the southern US. This is less prevalent in the north, which is why 'reactive aggression' homicide rates are lower there. So this kind of aggressive behaviour comes from a learned social norm rather than being instinctive.

Therefore culture can override **innate** predispositions, which is hard for ethological theory to explain.

Ritualistic aggression

One limitation is that aggression against members of the same species is not just ritualistic.

Jane Goodall (2010) observed a 'four-year war' during which male chimps from one community killed all the members of another group. They did this in a systematic way. On some occasions, a victim would be held down by rival chimps while others hit it in an attack lasting many minutes. The violence continued even though the victims offered appeasement signals. These signals did not inhibit the aggressive behaviour of the attackers as predicted by the ethological explanation.

This challenges the ethological view that same-species aggression has evolved into a self-limiting and relatively harmless ritual.

FAPs are not fixed

Another limitation is that Lorenz's original view of FAPs is outdated.

He saw FAPs as innate and unchanging. But the psychologist Morton Hunt (1973) has pointed out that FAPs are actually greatly influenced by environmental factors and learning experiences. For instance, an aggressive FAP is typically made up of several behaviours in a series. The duration of each behaviour varies from one individual to another, and even in the same individual from one encounter to another. Because they are modifiable by experience, many ethologists now prefer the term 'modal behaviour pattern' to reflect this.

Therefore patterns of aggressive behaviour are much more flexible than Lorenz thought, especially in humans.

Evaluation eXtra

Born to be aggressive?

Ethologists argue that aggression is an innate instinct. An important implication of this view is that humans will inevitably be aggressive and fight each other (e.g. in wars). Lorenz argued that this inevitability is demonstrated by FAPs.

However, other approaches in psychology (e.g. the cognitive approach) suggest that aggression is not inevitable because it is more under rational control than instinctive. It is also less innate and more affected by learning experiences than ethologists accept.

Consider: *Is human aggression inevitable?*

Apply it Concepts — Robin rage

Asif often sees different species of bird in his garden, including robins. One day, he noticed two robins appearing to square up to each other. One in particular was making a lot of noise, flapping its wings, sticking its chest out, and making head-down charging gestures at the other.

Question

Using your knowledge of ethology, explain the robin's aggressive behaviour. How could Asif investigate it further? Refer to innate releasing mechanisms, fixed action patterns and research studies in your explanation.



Lorenz's famous example of a wolf displaying its jugular vein is not a form of appeasement. Rudolph Schenkel (1967) argued it is a challenge that leads to further fighting.

Apply it Methods — Observing aggression

A psychologist wanted to carry out an observational study of children's aggressive play behaviour. She conducted a pilot study of a group of five children. She identified several categories of aggressive behaviour and two independent observers recorded instances of each behaviour to see how a child might use aggression to establish dominance over the others in the group.

Questions

1. Suggest *three* **operationalised behavioural categories** the observers could use to identify aggressive behaviours. (*3 marks*)
2. Explain how **time sampling** and **event sampling** could be used in this study. (*2 marks + 2 marks*)
3. The observers recorded each aggressive behaviour as it occurred. Identify the **level of measurement** used and explain your answer. (*2 marks*)
4. What is a **pilot study** and why might one be useful in this research? (*3 marks*)
5. **Inter-observer reliability** was low in this pilot study. Explain what the researcher could do to improve it before carrying out the main **observational** study. (*3 marks*)

Check it

1. In relation to the ethological explanation of aggression, explain what is meant by 'innate releasing mechanisms' **and** 'fixed action patterns'. *[2 marks + 2 marks]*
2. Outline the ethological explanation of aggression. *[6 marks]*
3. Describe **and** evaluate the ethological explanation of aggression. *[16 marks]*

Evolutionary explanations of human aggression

The specification says...

Evolutionary explanations of human aggression.

Aggression is usually seen as a wholly destructive behaviour, and of course its consequences often are. But does it bring any benefits to those who use it? For evolutionary explanations, the answer has to be 'yes'.

David Buss and Joshua Duntley (2006) have identified several adaptive functions of aggression, including acquiring resources and increasing status. Two highly researched functions are defeating sexual rivals and retaining mates.

Key term

Evolutionary explanation An account of the changes in species over millions of years based on the idea of natural selection – any behaviour that enhances survival and ultimately successful reproduction is perpetuated.

Apply it

Concepts Leaving

For years Shula's partner has kept a close eye on her every move. Each time Shula goes out he wants to know where she's been and who she's seen. She also suspects he's checking her phone for messages and calls. Sometimes Shula's partner has to go away for work, and he is even worse when he gets back. Shula is planning to leave as soon as possible.

Question

How does evolutionary theory explain the behaviour of Shula's partner?



How far would a man go to keep his partner from straying? Violence would not be out of the question, according to evolutionary theory.

Evolutionary explanations of human aggression

Evolutionary explanation of sexual jealousy

Sexual jealousy is a major motivator of **aggressive** behaviour in males which can be given an **evolutionary explanation**. Jealousy occurs because men, unlike women, can never be totally sure about whether or not they are their child's parent. This *paternity uncertainty* is a result of the very real threat for the male of *cuckoldry* (having to raise offspring that is not his own). Any investment in offspring who do not share the male's genes is a waste of his resources. It contributes to survival of a rival's **genes** and leaves the 'father' with fewer resources to invest in his own future offspring.

Men in our evolutionary past who could avoid cuckoldry were more reproductively successful. So psychological mechanisms have evolved to increase anti-cuckoldry behaviours in males. For instance, sexual jealousy is more strongly experienced in males than in females. This drives the often aggressive strategies men employ to retain their partners and prevent them from 'straying'. These strategies were **adaptive** in our evolutionary history.

Mate retention strategies Margo Wilson and Martin Daly (1996) identify several mate retention strategies which involve aggression and even physical violence, including:

- *Direct guarding* involves male vigilance over a partner's behaviour, for example checking who they've been seeing, coming home early, keeping tabs on their whereabouts, installing tracking apps on their mobiles, etc.
- *Negative inducements,* such as issuing threats of dire consequences for infidelity ('I'll kill myself if you leave me').

Physical violence against partner Margo Wilson *et al.* (1995) asked women to report mate retention strategies in their partners. This was measured in terms of the extent to which they agreed with statements like, 'He insists on knowing who you are with and where you are at all times'.

Women who did agree with such statements were twice as likely to have experienced physical violence at the hands of their partners. Of these women, 73% required medical attention and 53% said they feared for their lives. This supports the view that mate retention strategies are linked to physical violence.

Evolutionary explanation of bullying

Bullying occurs because of a power imbalance – a more powerful individual uses aggression deliberately and repeatedly against a weaker person. Researchers have traditionally viewed bullying as a maladaptive behaviour, for example the result of poor social skills or childhood abuse. However, our evolutionary ancestors may have used bullying as an adaptive strategy to increase their chances of survival by promoting their own health and creating opportunities for reproduction.

Male bullying Tony Volk *et al.* (2012) argue that the characteristics associated with bullying behaviour are attractive to females – dominance, acquisition of resources, and strength. Bullying also has the benefit of warding off potential rivals. Therefore such bullying behaviour would be **naturally selected** because these males would have greater reproductive success. Bullying may even benefit the bully's health. Adolescent boys who gain a reputation for being tough are less likely to experience aggression themselves as other boys avoid contact with them. This benefits their health as those at the top of a dominance hierarchy experience less stress (Sapolsky 2004).

Female bullying In females bullying more often takes place within a relationship and is a method of controlling a partner. Women use bullying behaviour to secure their partner's fidelity, which means they continue to provide resources for future offspring. Again such behaviour would be naturally selected because of enhanced reproductive success (Campbell 1999).

Study tip

It is vital that you link evolutionary explanations to aggressive behaviour as this topic is not just about evolutionary explanations – it is evolutionary explanations of human aggression. It is easy to slip into writing a rather generic evolutionary explanation with the word 'aggression' added occasionally. That would not count as a good evolutionary explanation of aggression – you need to include specific terms and concepts.

Practical activity on page 313

Evaluation

Gender differences

One strength is that evolutionary theory can explain why males and females differ in their uses of aggression.

Lots of research shows that there are gender differences in aggression. Such differences could be due to socialisation but some can be explained in terms of adaptive strategies. For example, Anne Campbell (1999) argues that it is not adaptive for a female with offspring to be physically aggressive because such behaviour would put her own survival at risk and that of her child. So a more adaptive strategy for females is to use verbal aggression to retain a partner who provides resources. This would explain why women tend to display verbal rather than physical aggression.

Therefore such arguments can provide support for the evolutionary approach to explaining aggression.

Cultural differences

One limitation is that there are substantial cultural differences in aggressive behaviour.

Far from being universal, there are some cultures where aggression appears to be almost non-existent. For example, the !Kung San people of western Botswana in Africa were studied by the anthropologist Elizabeth Thomas (1958) who called them the 'Harmless People'. She found they have very negative attitudes towards the use of aggression. Aggressive behaviour is discouraged from childhood in both boys and girls and is therefore rare. Those who do use it have their status and reputation within the community diminished. Cultural and social norms powerfully constrain aggressive behaviour in this society.

Therefore, since some cultures do not show aggressiveness, such behaviour may not necessarily be adaptive.

Counterpoint However, there is a lot of controversy over how 'harmless' the !Kung really are. For example, Richard Lee (1979) described the homicide rate as surprisingly high for such a peaceable people. These contradictions in findings may be due to the fact that what an observer 'sees' is biased by their own expectations and also by the particular sample of people they observe.

These methodological issues mean that observations by 'outsiders' may not be useful (lacks validity).

Real-world application

Another strength is that evolutionary explanations can be used to reduce bullying.

One approach to reducing bullying is to address a bully's perceived deficiencies (assuming that they bully because they feel inferior). However, although there are several interventions based on this assumption, bullying is still prevalent. Bruce Ellis *et al.* (2016) suggest an alternative strategy based on the view that bullying is adaptive (i.e. bullies stand to gain advantages for themselves). The 'meaningful roles' anti-bullying intervention aims to increase the costs of bullying and the rewards of prosocial alternatives. For example, by giving bullies roles and responsibilities in school that provide an alternative source of status.

Therefore viewing bullying as an adaptive behaviour may lead to more effective anti-bullying interventions.

Evaluation eXtra

Determinism versus free will

The evolutionary argument is biologically determinist. We are aggressive because of adaptations that increased the survival chances of our ancestors and are beyond our control. This implies that aggression is inevitable and is not our 'fault'.

However, humanistic psychologists argue aggression is subject to us exercising our free will. Also, cognitive factors allow us to think about the consequences of our behaviour. This is supported by research into cultural differences. So aggression is not inevitable and is always our own responsibility.

Consider: *To what extent is aggression biologically determined?*



Mate retention strategies can be adaptive for both partners.

Apply it Concepts

Bullies never prosper – or do they?

Fred is being bullied at school. His bully is making his life a misery, but Fred is too scared to tell anyone in case it makes the situation worse. What he can't understand is why his bully seems to be so popular. Fred can't tell if it's because people genuinely like him or if it's because they're just frightened of him.

Question

Knowing what you do about the evolutionary explanation of bullying, how would you explain to Fred why his bully behaves the way he does?

Apply it Methods

Questions of aggression

A psychologist recruited 60 heterosexual couples for a study into the relationship between sexual jealousy and aggression in men.

The 60 male partners completed a questionnaire measuring jealousy in terms of mate retention behaviours: 17 indicated they monitored their partner closely, and 26 issued aggressive threats. The 60 female partners completed a different questionnaire indicating how much aggression they had experienced at the hands of their partner. Five of the women said they had experienced serious verbal aggression, and 12 had experienced physical aggression.

Questions

1. For either questionnaire, write *one* question that could gather **quantitative data** and *one* that could gather **qualitative data**. (*2 marks*)
2. Explain *one* reason why the psychologist thought questionnaires might be better than **interviews** in this study. (*2 marks*)
3. Calculate the responses of males and females as percentages (*four* percentages). (*4 marks*)
4. Draw a **bar chart** to represent the findings of the study. Make sure you label the axes carefully. (*3 marks*)
5. Explain *one* **ethical issue** that the researcher should have considered, and how she could have dealt with it. (*2 marks* + *2 marks*)

Check it

1. Outline evolutionary explanations of human aggression. *[6 marks]*
2. Explain **one** limitation of evolutionary explanations of human aggression. *[4 marks]*
3. Discuss evolutionary explanations of human aggression. *[16 marks]*

Social psychological explanations of aggression: Frustration-aggression hypothesis

The specification says...

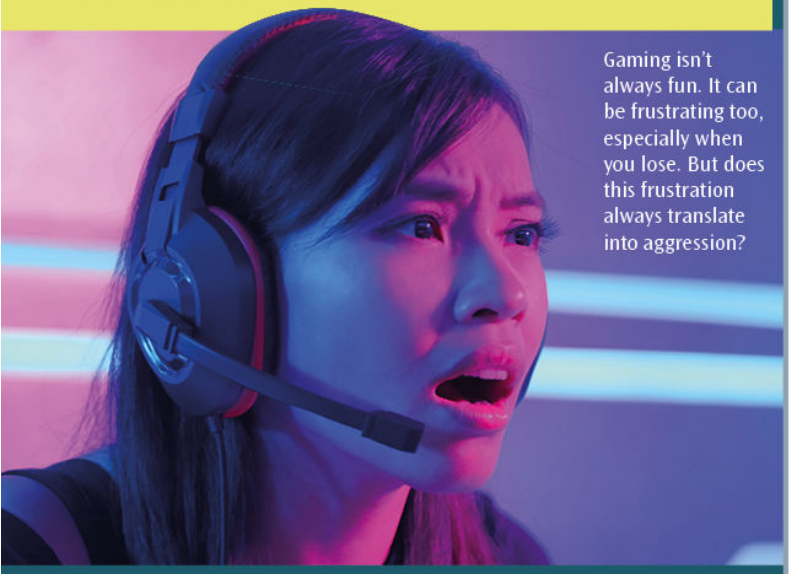
Social psychological explanations of human aggression, including the frustration-aggression hypothesis.

Biological explanations don't really get to the heart of most people's experience of aggression. If you were to ask people about how they understand their own aggressive behaviour, they might talk about how they felt, or what they were thinking, or what events triggered them to be aggressive. Social psychological explanations better address the way we experience aggression.

Key terms

Social psychological explanations of aggression Any theory that argues aggression is the result of an interaction between an individual's characteristics and features of the situations in which behaviour occurs.

Frustration-aggression hypothesis A social psychological theory that argues that anger, hostility and even violence are always the outcome when we are prevented from achieving our goals (i.e. frustration).



Gaming isn't always fun. It can be frustrating too, especially when you lose. But does this frustration always translate into aggression?

Apply it

Concepts Jacinta's frustrating day

Jacinta is a sixth-form student who decided to look for a part-time job. Eventually she went for an interview at a new pizza place opening up in town. Despite preparing for the interview really thoroughly, she didn't get the job. On her way out of the interview, which was two miles from her house, she found that she'd lost the £10 note for her bus fare, and she'd forgotten to bring her phone with her, so she had to walk home. All the way back Jacinta thought long and hard about how unfair it all was, so by the time she arrived home she was fuming. The first thing she did was shout at her little sister.

Question

Explain how the frustration-aggression hypothesis accounts for Jacinta's behaviour.

The frustration-aggression hypothesis

The original hypothesis

John Dollard and his colleagues (1939) first formulated the **frustration-aggression hypothesis**. This states that frustration always leads to aggression, and aggression is always the result of frustration. Aggression is a psychological drive akin to biological drives such as hunger. We experience frustration when our attempts to reach a goal are blocked by some external factor. This creates an aggressive drive, which leads to aggressive thoughts/behaviour, such as a violent fantasy, a verbal outburst or perhaps even physical violence. This removes the negative emotion, which is called *catharsis* (a **psychodynamic** concept). The aggression created by the frustration is satisfied, thereby reducing the drive and making further aggression less likely. The aggressive behaviour is cathartic and we feel better.

The F-A hypothesis recognises that aggression is not always expressed directly against the source of frustration, for three reasons:

- The cause of our frustration may be abstract, such as the economic situation, the government, or the music industry.
- The cause may be too powerful and we risk **punishment** by aggressing against it, e.g. the teacher who gave you a lower grade than you expected.
- The cause may just be unavailable at the time, e.g. perhaps your teacher left the room before you realised what grade you got.

So our aggression is deflected (or *displaced*) onto an alternative – one that is not abstract, is weaker and is available (an inanimate object, pet, or younger sibling).

The weapon effect

Even if we become angry, we still might not behave aggressively. According to Leonard Berkowitz (1989), frustration merely creates a readiness for aggression. But the presence of aggressive cues in the environment make acting upon this much more likely. Therefore cues are an additional element of the frustration-aggression hypothesis.

Berkowitz demonstrated the so-called weapon effect in a laboratory study (Berkowitz and LePage 1967). Participants were given real electric shocks by a confederate, creating anger and frustration. The participants later had the opportunity to give fake shocks to the confederate. The number of shocks was greater when there were two guns on a table compared to other conditions where there were no guns (average 6.07 versus 4.67).

This weapon effect supports Berkowitz's contention that the presence of aggressive environmental cues stimulates aggression.

Research on frustration-aggression

Russell Geen (1968) carried out a study to investigate how frustration affects aggression.

Procedure University students (men) completed a jigsaw puzzle. Their level of frustration was experimentally manipulated in one of three ways. For some participants, the puzzle was impossible to solve. For others, they ran out of time because another student in the room (a **confederate** of the researcher) kept interfering. For a third group, the confederate insulted the participant as they failed to solve the puzzle. All participants later had the opportunity to give the confederate electric shocks.

Findings The insulted participants gave the strongest shocks on average, followed by the interfered group, then the impossible task participants. All three groups selected more intense shocks than a (non-frustrated) **control group**.

Evaluation

Research support

One strength is research support for a key concept of the frustration-aggression hypothesis.

Amy Marcus-Newhall *et al*. (2000) conducted a **meta-analysis** of 49 studies of displaced aggression. These studies investigated situations in which aggressive behaviour had to be directed against a 'human target' other than the one who caused the frustration. The researchers concluded that displaced aggression is a reliable phenomenon. Frustrated participants who were provoked but unable to retaliate directly against the source of their frustration were significantly more likely to aggress against an innocent party than people who were not provoked.

This shows that frustration can lead to aggression against a weaker or more available target.

Role of catharsis

One limitation is research showing that aggression may not be cathartic.

Brad Bushman (2002) found that participants who vented their anger by repeatedly hitting a punchbag actually became more aggressive rather than less. Doing nothing was more effective at reducing aggression than venting. Bushman argues that using venting to reduce anger is like using petrol to put out a fire. It does not work even for people who believe in its value. In fact, according to Bushman, 'The better people feel after venting, the more aggressive they are'.

This shows that a central assumption of the frustration-aggression hypothesis may not be valid.

Frustration–aggression link

Another limitation is that the link between frustration and aggression is complex.

Very early on in research into the frustration-aggression hypothesis it became clear that frustration does not always lead to aggression, and that aggression can occur without frustration. There is nothing 'automatic' about the link between the two. Someone who feels frustrated may behave in a range of different ways. Rather than being aggressive, they may instead be helpless or determined. Likewise, someone who behaves aggressively may do so for many reasons.

This suggests that the frustration-aggression hypothesis is inadequate because it only explains how aggression arises in some situations but not in others.

Counterpoint However, Berkowitz (1989) reformulated the initial hypothesis to take account of the above criticism. His *negative affect theory* argued that frustration is just one of many aversive stimuli that create negative feelings (affect) – others include loneliness, jealousy and pain. Aggressive behaviour is triggered by these negative feelings generally rather than by frustration specifically. The outcome of frustration can be a range of responses, only one of which is aggression. For example, you might feel frustrated at getting a poor essay grade and become despairing, anxious, determined, complacent or whatever.

Therefore frustration (negative feelings) can form part of a wider explanation of what causes aggression.

Evaluation eXtra

Gun control

As Berkowitz (1989) said, 'the finger pulls the trigger'. This means that 'open carry' in the US, where a gun is not concealed, does not cause violence in itself. Individuals are responsible for their use of weapons, even when they are frustrated.

However, Berkowitz also said, 'the trigger may be pulling the finger'. Gun violence depends on the presence of cues. The open presence of a gun acts as a cue to aggressive behaviour, as shown by Berkowitz and LePage's (1967) study.

Consider: *Should gun availability be controlled?*

Apply it Concepts — A pain in the neck

Ethan was working very hard trying to finish an essay that he had to hand in the next morning. Unfortunately, his little sister had other ideas and kept pestering him, wanting to play, insisting on talking to him, fiddling around with his pens and just generally getting in the way. Ethan eventually became very anxious, because he could see that he was never going to get his essay done.

Question

Use your knowledge of the frustration-aggression hypothesis to explain why Ethan responded in the way he did rather than becoming angry and aggressive.



The American way? Openly carrying a gun, as in some states of the US, may stimulate violence as well as enable it.

Apply it Methods — Winding them up

A researcher arranged for his participants to play a video game against a skilled opponent called Sadie (a confederate). Sadie was told to 'trash talk' half of the participants by being sarcastic, disparaging and dismissive during the game. She was friendly towards the other half of the participants. She was also instructed to win all her games, which she did.

After their game, each participant had to rate Sadie's skill on a scale from 0 (no skill at all, just lucky) to 10 (extremely skilled). This was the researcher's measure of aggression.

Questions

1. What are the **operationalised independent variable** and **dependent variable** in this study? (*1 mark + 1 mark*)
2. Write a **non-directional hypothesis** for this experiment. (*2 marks*)
3. The researcher **randomly allocated** the participants to the two conditions. Explain how he could have done this and why it was necessary. (*2 marks + 2 marks*)
4. Explain why this **experiment** might be lacking in validity. (*3 marks*)
5. The researcher wanted to calculate a **measure of central tendency** to summarise the aggression scores. Identify a suitable measure and give *one* reason why it would be appropriate. *(1 mark + 1 mark)*

Check it

1. Briefly outline the frustration-aggression hypothesis as an explanation of human aggression. *[2 marks]*
2. Outline what research has shown about the frustration-aggression hypothesis. *[4 marks]*
3. Describe **and** evaluate research into the frustration-aggression hypothesis as an explanation of human aggression. *[16 marks]*

Social psychological explanations of aggression: Social learning theory

The specification says...

> Social psychological explanations of human aggression, including social learning theory as applied to human aggression.

According to Albert Bandura (1973), aggression is behaviour learned in social contexts. Social learning theory (SLT) does not deny that biological factors play a role in how we acquire aggressive behaviours. But everything that really matters about aggression is learned.

Key term

Social learning theory (SLT) A way of explaining behaviour that includes both direct and indirect reinforcement, combining learning theory with the role of cognitive factors.

Apply it Concepts

The imitation game

Willie has a three-year-old daughter called Meggy and a pet dog called Brutus. One day, while she was playing with Brutus, Meggy suddenly poked him firmly on the nose and said 'very naughty dog'. Willie was surprised because it was the first time he had seen his daughter do this. Then he realised that this was exactly what he himself had done to the dog the day before.

Question

How would you explain Meggy's aggressive behaviour in terms of social learning?



Some of the children in Bandura *et al.*'s 'Bobo doll' study imitated adult behaviour almost exactly.

Social learning theory applied to human aggression

Direct and indirect learning

In social learning theory (SLT), Albert Bandura acknowledged that aggression can be learned directly, through mechanisms of **operant conditioning** involving **positive** and **negative reinforcement** and **punishment**. So a child who angrily snatches a toy off another child will learn that aggressive behaviour is rewarding. This direct reinforcement makes it more likely that the child will behave aggressively again in a similar situation. However, Bandura also realised that aggressive behaviour often cannot be explained by such direct forms of learning, especially in humans. So he argued that an indirect mechanism – **observational learning** – accounts for social learning of most aggressive behaviours.

Observational learning and vicarious reinforcement

Children (and adults to some extent) acquire specific aggressive behaviours through observing aggressive models, such as siblings, parents, peers, and characters in the media. In this way, the child has learned about aggressive behaviour, but this does not mean that they will behave aggressively themselves. As well as observing the behaviour of models, children also observe the *consequences* of their behaviour. If the model's aggressive behaviour is rewarded (or at least not punished), then the child learns that aggression can be effective in getting what they want. This is known as **vicarious reinforcement**, and it makes it more likely that the observing child will imitate the model's aggressive behaviour.

There is a parallel form of indirect learning called *vicarious punishment*. If a model's use of aggression to achieve a goal is punished, an observing child is less likely to imitate that specific behaviour.

Cognitive conditions for learning

Bandura identified four **cognitive** conditions needed for social learning:

- *Attention* – a basic cognitive requirement is that the observer must pay attention to the model's aggressive actions.
- *Retention* – the observer also needs to be able to remember the model's aggressive actions, to form a symbolic mental representation of how the behaviour is performed.
- *Reproduction* – the observer must be able to transform the mental representation of the aggressive behaviour into actual physical action. This involves the individual mentally appraising their ability to do this.
- *Motivation* – the observer needs a reason to imitate behaviour, which will depend on their expectations that behaving aggressively in a specific situation will be rewarding.

Self-efficacy

Self-efficacy is the extent to which we believe our actions will achieve a desired goal. A child's confidence in their ability to be aggressive grows as they learn that aggression can bring rewards. For example, consider a child who regularly hits other children to get hold of a toy. They learn that they have the motor skills necessary to force another child to hand over the toy, and that this ability comes easily to them. The child's sense of self-efficacy develops with each successful outcome. He or she is confident that, because their aggression has been effective in the past, it will continue to be so in the future. In others words, they learn that aggression works and they are good at it.

Bandura *et al.*'s research

Bandura *et al.*'s (1961) famous Bobo doll study illustrates many of the features of SLT discussed on this spread.

Procedure Young children individually observed an adult model assaulting an inflatable plastic toy called a 'Bobo doll'. The aggressive behaviours included throwing, kicking and hitting with a mallet, and were accompanied by verbal outbursts such as 'Sock him in the nose!'. There followed a short period during which the children were not allowed to play with some attractive toys, which created a degree of frustration. They were then taken to another room where there was a Bobo doll, plus some other toys including ones the adult model had used.

Findings Without being instructed to do so, many of these children imitated the behaviour they had seen performed by the model, physically and verbally. The closeness of the imitation was remarkable in some cases, virtually a direct copy of what the children had observed, including the use of specific objects and verbal phrases. Boys imitated physical aggression more than girls, but there was no difference in imitating verbal aggression. Boys were also more likely than girls to imitate a same-sex model. There was also another group of children who had observed an adult interacting non-aggressively with the doll. Aggressive behaviour towards the Bobo doll by these children was almost non-existent.

Evaluation

Research support

One strength of SLT is research supporting its explanation of aggression.

François Poulin and Michel Boivin (2000) found that aggressive boys aged between 9 and 12 years formed friendships with other aggressive boys. These friendships mutually reinforced each boy's aggressive behaviour through modelling. For example, the boys would observe each other successfully using proactive aggression (to get what they wanted from peers), which provided reinforcement. This means they were exposed frequently to models of physical aggression (i.e. each other) and to its positive consequences. The boys also gained reinforcement from the rewarding approval of the rest of the 'gang'.

These social learning processes made imitation of aggressive behaviour by the boys much more likely, as predicted by SLT.

Counterpoint However, the above study did not find similarity between friends for reactive aggression. Reactive aggression ('hot-blooded') is angry retaliation in the heat of the moment. The researchers found that the boys were much less likely to influence each other's reactive aggressive outbursts. They observed them but generally did not imitate them. This was perhaps because the consequences of reactive aggression are unpredictable and not often as positive as they are for planned, proactive aggression (so less reinforcing).

Therefore SLT is limited because it is a relatively weak explanation of reactive aggression.

Real-world application

Another strength is that SLT can help reduce aggression.

Children readily imitate models when they observe them being rewarded for any behaviour and especially when they identify with them. This applies to modelling aggressive behaviour. One way to reduce aggression is to provide rewarded non-aggressive models. The same learning processes that can lead to aggressive behaviour can produce non-aggression. For instance, encouraging children to form friendships with children rewarded for non-aggression (and/or presenting them with media characters) gives them more opportunities to model non-aggressive behaviour.

Therefore SLT offers practical steps to reduce the development of aggressive behaviour in children.

Biological influences

One limitation of SLT is that it underestimates the influence of biological factors.

Bandura recognised the role of biology because he accepted that there is an urge to be aggressive that is instinctive in nature. But he was equally clear that the form aggression takes is primarily learned and is the outcome of 'nurture'. However, as we have seen on previous spreads, it is well established that there are powerful genetic, evolutionary, neural and hormonal influences on aggression. SLT barely acknowledges these and certainly does not explain them.

Therefore, SLT is an incomplete explanation of aggression because it underplays the role of biological factors.

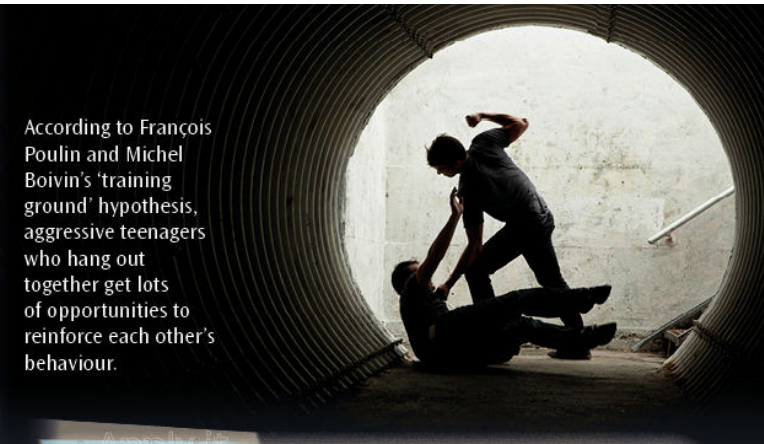
Evaluation eXtra

Research methods

Many studies into social learning and aggression are conducted in controlled conditions (e.g. Bandura *et al.* 1961). This means researchers can manipulate an independent variable while controlling potential confounding variables. Control allows researchers to establish that social learning processes may *cause* aggressive behaviour.

However, such studies are unlike real-world social learning situations. They create 'ideal' testing conditions which generally do not exist in reality. An important one in Bandura *et al.*'s study was that the Bobo doll could not retaliate to being hit. There are also demand characteristics, e.g. the Bobo doll is designed to be hit.

Consider: *How useful are controlled studies for understanding social learning of aggression?*



According to François Poulin and Michel Boivin's 'training ground' hypothesis, aggressive teenagers who hang out together get lots of opportunities to reinforce each other's behaviour.

Apply it Concepts — Cycle of violence

Ram grew up in a family where physical aggression was a feature of everyday life. This sometimes took the form of actual physical violence. He even witnessed his dad hitting his mum on several occasions. Now that he is 15, Ram has a reputation as an aggressive bully who is always prepared to use physical means to get what he wants. He is attracted to situations in which violence is likely to 'kick off', and has made friends with other boys who are just as aggressive as him.

Questions

1. Use your knowledge of social learning theory to explain Ram's behaviour.
2. What other explanation could acccount for his behaviour? Explain your choice.

Apply it Methods — Observing observational learning

Two researchers carried out an observational study of aggressive behaviour. Children between the ages of five and seven years individually observed an adult behaving aggressively towards an inflatable plastic figure. The children were then given the opportunity to play with the figure and with some other toys as well. The researchers identified behavioural categories to use to record the incidence of several aggressive behaviours.

Questions

1. Explain *one* strength and *one* limitation of using an observational method in this study. (*2 marks + 2 marks*)
2. Explain how this observational study could be conducted to make it **controlled**, **covert** and **non-participant**. (*3 marks*)
3. Explain *one* **sampling technique** the researchers could use to recruit children for this study. (*2 marks*)
4. Evaluate the technique you have identified in your previous answer. (*4 marks*)
5. Explain *one* **ethical issue** that the researchers should have considered before conducting the study and how they could have dealt with it. (*2 marks + 2 marks*)

Check it

1. Outline the social learning theory of human aggression. *[6 marks]*
2. Briefly describe **two** social psychological explanations of human aggression. *[6 marks]*
3. Discuss the social learning theory of human aggression. *[16 marks]*

Social psychological explanations of aggression: De-individuation

The specification says...

Social psychological explanations of human aggression, including de-individuation.

Aggression often happens in groups, but this context has mostly been overlooked by the explanations we have explored so far. The de-individuation explanation argues that, by immersing our personal identity in a group, we are all capable of behaving in aggressive and even violent ways that we never would on our own.

Key term

De-individuation A psychological state in which an individual loses their personal identity and takes on the identity of a social group when, for example, in a crowd or wearing a uniform. The result may be decreased concern about the evaluation of others.

Study tip

De-individuation is one of several theories/explanations of aggression in this chapter. For all of them, it's tempting to describe them as explanations of behaviour in general. However, you must always make sure your description is closely linked to aggression. Whenever you write such a description, read through it and ask yourself whether you can clearly tell that it's about aggression. If you can't, then it's a weak answer.



Just one face in a crowd of many. But does knowing that make it more likely that this woman will behave aggressively?

De-individuation

Crowd behaviour

De-individuation is a concept originally used by Gustave Le Bon (1895) to explain the behaviour of individuals in crowds. Usually, because we are easily identified by others, our behaviour is constrained by social norms. We live in a society where most forms of aggression are discouraged. But when we become part of a crowd, we lose restraint and have the freedom to behave in ways we wouldn't otherwise. We lose our senses of individual self-identity and responsibility for our behaviour. We disregard norms and even laws. Responsibility becomes shared throughout the crowd, so we experience less personal guilt about directing harmful aggression at others.

De-individuation and aggression

Philip Zimbardo (1969) distinguished between individuated and de-individuated behaviour. In an individuated state, our behaviour is rational and normative (i.e. it conforms to social norms). But de-individuated behaviours are emotional, impulsive, irrational, disinhibited and anti-normative. So when we are in a de-individuated state, we lose self-awareness, stop monitoring and regulating our own behaviour, ignore social norms and 'live for the moment', failing to form longer-term plans.

The conditions of de-individuation which promote aggressive behaviour include darkness, drugs, alcohol, uniforms, masks and disguises. A major factor is anonymity. According to John Dixon and Kesi Mahendran (2012), '*anonymity shapes crowd behaviour*'. We have less fear of retribution because we are a small and unidentifiable part of a faceless crowd. The bigger the crowd, the more anonymous we are. Anonymity provides fewer opportunities for others to judge us negatively.

Reduced self-awareness

The experience of de-individuation as part of a faceless crowd creates a greater likelihood of aggression. But according to Steven Prentice-Dunn and Ronald Rogers (1982), this is not due to anonymity directly, but to the *consequences* of anonymity. They explain this process in terms of two types of self-awareness:

- *Private self-awareness* concerns how we pay attention to our own feelings and behaviour. This is reduced when we are part of a crowd. Our attention becomes focused outwardly to the events around us, so we pay less attention to our own beliefs and feelings. We are less self-critical and less thoughtful, which promotes a de-individuated state.
- *Public self-awareness* refers to how much we care about what other people think of our behaviour. This is also reduced in crowds. We realise that we are just one individual amongst many, we are anonymous and our behaviour is less likely to be judged by others. We no longer care how others see us, so we become less accountable for our aggressive actions.

Research on de-individuation

David Dodd (1985) was a psychology teacher who developed a classroom exercise to illustrate de-individuation.

Procedure He asked 229 undergraduate psychology students in 13 classes this question: 'If you could do anything humanly possible with complete assurance that you would not be detected or held responsible, what would you do?'. The students knew their responses were completely anonymous. Three independent raters who did not know the **hypothesis** decided which categories of antisocial behaviour the responses belonged to.

Findings Dodd found that 36% of the responses involved some form of antisocial behaviour. 26% were actual criminal acts, the most common of which was 'rob a bank'. A few students opted for murder, rape and assassination of a political figure. Only 9% of responses were prosocial behaviours (such as helping people). In terms of how people imagine they would behave, this study demonstrates a link between anonymity, de-individuation and aggressive behaviour.

Apply it Concepts

Mum knows best

On 28 April 2015 a funeral in Baltimore, US of a young man who died in police custody became a violent riot. Michael Graham was one of many who put on a balaclava, picked up a makeshift weapon, and joined other rioters burning down buildings and assaulting police officers. Michael's mother Toya recognised him on live TV coverage, and went onto the streets to forcibly march him back home. When she ripped off his balaclava in front of the cameras, Michael became a lot more co-operative. (*Based on a real event.*)

Question

How does de-individuation theory explain Michael's behaviour?

Evaluation

Research support

One strength is research support for de-individuation.

Karen Douglas and Craig McGarty (2001) looked at aggressive online behaviour in chatrooms and uses of instant messaging. They found a strong correlation between anonymity and 'flaming' (posting hostile messages). They found that most aggressive messages were sent by those who chose to hide their real identities. This is a common behaviour of online 'trolls'. It has been implicated in high-profile cases of self-harm and even suicide.

This supports a link between aggressive behaviour and anonymity, a key element of de-individuation.

Counterpoint However, there is also evidence that de-individuation does not always lead to aggression. In Kenneth Gergen *et al.*'s (1973) 'deviance in the dark' study, groups of eight strangers were placed in a completely darkened room for one hour. They were told to do just whatever they wanted to, they could not identify each other and they would never meet again. They very quickly stopped talking and started touching and kissing each other intimately. In a second study Gergen *et al.* told new participants they would come face-to-face afterwards. In this case the amount of touching/kissing was much lower.

Therefore de-individuation may not always lead to aggression.

Real-world de-individuation

Another strength is de-individuation can explain the aggressive behaviour of 'baiting crowds'.

Leon Mann (1981) investigated instances of suicidal 'jumpers' (e.g. from buildings). He identified 21 cases reported in US newpapers of a crowd gathering to 'bait' a jumper, i.e. encourage him or her to jump. These incidents tended to occur in darkness, the crowds were large and the jumpers were relatively distant from the crowd (i.e. high up). These are the conditions predicted by de-individuation theory to lead to a state of de-individuation in crowds, which led to aggressive baiting.

Therefore there is some **validity** to the idea that a large group can become aggressive in a de-individuated 'faceless' crowd.

Role of norms

One limitation is that de-individuated behaviour is normative rather than anti-normative.

De-individuation theory argues that we behave in ways that are contrary to social norms (e.g. disinhibited aggression) when we are less aware of our private identity. However, in their SIDE model (social identity model of de-individuation), Russell Spears and Martin Lea (1992) argue that de-individuation actually leads to behaviour that *conforms* to group norms. These may be antisocial norms but could equally well be prosocial norms (e.g. helping). This happens because anonymity shifts an individual's attention from his or her private identity to their social identity as a group member.

This suggests that people in a de-individuated state remain sensitive to norms rather than ignoring them.

Evaluation eXtra

Nurture and nature

De-individuation highlights factors related to nurture in aggressive behaviour. These include anything that reduces private and public self-awareness. People who would not usually behave aggressively do so when part of a crowd (e.g. at a football match). Perhaps the ultimate example of this is online behaviour (e.g. social media).

However, we have seen on previous spreads that nature plays an important role in causing aggressive behaviour. These causes are genetic, ethological and evolutionary. This approach suggests that people are aggressive in crowds perhaps because the situation makes you feel stressed.

Consider: *Is aggression mostly the result of nurture or nature?*



In full uniform, this SWAT police officer is extremely anonymous. But does that also mean his or her behaviour is de-individuated?

Apply it Concepts — Help not harm

Carmen is a physiotherapist who took part in a protest against cuts to the NHS. She travelled to the protest on her own but soon joined in with thousands of other people – nurses, doctors and many other healthcare workers. They were all chanting and carrying placards about 'care not cuts'. Carmen saw a police officer collapse in the road, apparently having had a heart attack. She rushed over, and was soon followed by quite a few others all expressing concern for the officer and doing their utmost to help him.

Questions

1. Explain how de-individuation can account for this prosocial behaviour.
2. How would this challenge de-individuation as an explanation of aggression?

Apply it Methods — Uniform anonymity

A psychologist conducted an experiment to investigate the effect of anonymity on behaviour. Twenty volunteers were recruited to take part in a reaction-time game against a confederate of the experimenter. Every time the confederate lost the game, the participant was allowed to punish him with a loud noise delivered through headphones. The volume of this noise was selected by the participant and measured in decibels (dB). In one condition of the experiment, the participants all wore a soldier's uniform, complete with face camouflage, dark glasses and helmet. In the other condition they all wore their own clothes.

Questions

1. Write a **directional hypothesis** for this study. (*2 marks*)
2. Name the **experimental design** used in this study. (*1 mark*)
3. The psychologist realised that he would need to use **counterbalancing**. Explain how he could have done so, and why it was necessary. (*4 marks*)
4. Explain how **demand characteristics** might have affected the study. (*2 marks*)
5. Explain how *one* factor in this study might have affected its **external validity**. (*3 marks*)

Check it

1. Explain what is meant by 'de-individuation' in relation to human aggression. *[2 marks]*
2. Outline **one** limitation of de-individuation as an explanation of human aggression. *[2 marks]*
3. Describe **and** evaluate de-individuation as an explanation of human aggression. *[16 marks]*

Institutional aggression in the context of prisons

The specification says...

Institutional aggression in the context of prisons: dispositional and situational explanations.

Psychologists have been very interested in how institutions such as prisons might cultivate aggressive and violent behaviour. Two major theoretical stances have arisen to account for institutional aggression.

Dispositional explanations locate the causes of aggressive behaviour within the individual, in terms of factors that make one person different from another. Situational explanations, on the other hand, attribute responsibility for aggression to factors within the prison environment, and emphasise the importance of social context.

Key terms

Institutional aggression Aggressive or violent behaviour that takes place within the social context of a prison or other formal organised setting.

Dispositional explanation An explanation of behaviour that highlights the importance of the individual's personality (i.e. their disposition). Such explanations are often contrasted with situational explanations.

Situational explanation An explanation that identifies the causes of behaviour as existing within the environment, which may include other people. Such explanations are contrasted with dispositional explanations.

Some people respond to imprisonment with despair rather than aggression. Either way, psychologists want to know how influential the prison environment is.



Dispositional explanation

The importation model

John Irwin and Donald Cressey's (1962) *importation model* argues that prisons are not completely insulated from everyday life outside in the 'real world'. Prison inmates come from the outside world and they bring with them (import) a subculture typical of **criminality**. This includes beliefs, norms, attitudes and a history of learning experiences as well as other personal characteristics such as gender and ethnicity. This **dispositional explanation** is based on individual nature (e.g. inherited temperament) and also nurture (e.g. social environment).

The willingness of inmates to use violence inside prison to settle disputes reflects their lives before they were imprisoned. As Jim Thomas and Patrick McManimon (2005) put it: '... people who prey on others on the streets also prey on others in the prison'. Inmates import such behaviours and characteristics which then influence their use of aggression to establish power, status, influence and access to resources (the 'convict subculture').

Therefore, aggression is the product of individual characteristics (disposition) of inmates and not of the prison environment.

Prisoner characteristics linked to outcomes

Matt DeLisi *et al.* (2011) studied a group of juvenile offenders in Californian institutions who had negative backgrounds (e.g. childhood trauma, anger, histories of substance abuse and violent behaviour). These individuals were importing these characteristics (and the resulting dispositions) into prison. The researchers compared this group with a control group of inmates who did not have these negative features.

The 'negative' inmates were more likely to engage in suicidal activity, sexual misconduct and acts of physical aggression.

Situational explanation

The deprivation model

Donald Clemmer's (1958) deprivation model places the causes of **institutional aggression** within the prison environment itself, i.e. a **situational explanation**. Harsh prison conditions are stressful for inmates, who cope by resorting to aggressive and violent behaviour. These harsh conditions include psychological factors (e.g. deprived of freedom and sexual intimacy) and physical factors (e.g. deprived of goods and services). Deprivation of material goods is closely linked to aggression because it increases competition amongst inmates.

Aggression is also influenced by the nature of the prison regime. If it is unpredictable and regularly uses 'lock-ups' to control behaviour, then this creates frustration, reduces stimulation by barring other more interesting activities and reduces even further access to 'goods' (such as television). This is a recipe for violence, which becomes an adaptive solution to the problem of deprivation.

Prison-level factors linked to outcomes

Benjamin Steiner (2009) investigated factors predicting aggression in 512 US prisons. Inmate-on-inmate violence was more common in prisons where there was a higher proportion of staff who were women, overcrowding and more inmates in protective custody.

These are prison-level factors because they are independent of individual characteristics of prisoners. They reliably predicted aggressive behaviour in line with the deprivation model.

Apply it

Concepts Marilyn

Marilyn has been an inmate of a tough prison for just two months. She is still finding it quite hard to cope and a week ago she was involved in a riot organised by two of the longer-term inmates. The prisoners all set fire to their bedding, and barricaded themselves in the recreation room using whatever objects they could get their hands on. Five prison officers were hurt, one of them seriously. Marilyn had prepared for the riot by making herself a couple of 'shivs' (makeshift knives) in the prison workshop. She didn't use them, but she would have if necessary.

Question

Use your knowledge of situational factors to explain Marilyn's behaviour.

Evaluation

Research support

One strength is research support for the importation model.

Scott Camp and Gerald Gaes (2005) studied 561 male inmates with similar criminal histories and predispositions to aggression. Half were randomly placed in low-security Californian prisons and half randomly placed in high-security prisons. Within two years, there was no significant difference between prisons in the number of prisoners involved in aggressive misconduct (33% and 36%). The researchers concluded that features of the prison environment are less important predictors of aggressive behaviour than characteristics of inmates.

This is strong evidence for importation because of random allocation of inmates.

Ignores key factors

One limitation is that the importation model ignores key factors.

John Dilulio (1991) claims that the importation model ignores other factors that influence prisoners' behaviour, such as the way the prison is run. Instead, he proposed an *Administrative control model* (ACM) which states that poorly managed prisons are more likely to have inmate violence. Poor management includes weak leadership, a thriving culture of unofficial rules, staff who remain distant from inmates and few opportunities for education.

Therefore, importation is an inadequate explanation because institutional factors are probably more important than inmate characteristics.

Evaluation eXtra

Determinism and free will

The importation model may be determinist. Prisoners are aggressive because of 'negative' dispositions they import into prisons. They have little control over their dispositions. This implies that prison aggression is inevitable and that it is not the 'fault' of prisoners.

However, it could be argued that aggression in prisons is the outcome of prisoners exercising their free will. Cognitive factors also play a role. Aggression in prisons is therefore not inevitable and is the responsibility of individual prisoners.

Consider: *To what extent is the importation model determinist?*

Evaluation

Research support

One strength is research support for the deprivation model.

Mark Cunningham *et al.* (2010) analysed 35 inmate homicides in Texas prisons between 2000 and 2008. They found that the perpetrators' motivations for their violent behaviours were linked to some of the deprivations identified in Clemmer's model. Many of the homicides followed arguments between cell-sharing inmates, where 'boundaries' were judged to have been crossed. Particularly important were arguments over drugs, sexual activity and personal possessions.

These factors are identified by the deprivation model, supporting the model's validity.

Contradictory research

One limitation is research contradicting the deprivation model.

The model predicts that a lack of heterosexual contact should lead to high levels of aggressive behaviour in prisons. However, Christopher Hensley *et al.* (2002) studied 256 male and female inmates of two prisons in Mississippi, a state of the US which allows conjugal visits (that is, visits from partners specifically to have sex). There was no link between involvement in these visits and reduced aggressive behaviour.

This suggests that situational factors do not substantially affect prison violence.

Evaluation eXtra

Importation versus deprivation

The importation model of prison aggression is supported by well-controlled experimental evidence. For example, DeLisi *et al.*'s (2011) natural experiment used a control group. Camp and Gaes' (2005) experiment used random allocation.

However, the deprivation model is supported by evidence that has other strengths. For example, Steiner (2009) looked at aggression in a wide range of 512 US prisons. Cunningham *et al.* (2010) studied all the prisons in Texas over nine years.

Consider: *Which is the more valid explanation, dispositional or situational?*

Apply it Concepts

One bad apple?

Sergio is serving a five-year prison sentence for serious violence which put a police officer in hospital. He has a history of bullying during his time at school, and in the six months since he started his sentence he has been involved in several fights. He is now in trouble for assaulting a prison officer. If he carries on like this, Sergio's aggressive behaviour will affect his future chances of being released on parole.

Question

How would a dispositional explanation account for Sergio's behaviour?



A disposition to violence? Those who use aggression outside prison are very likely to use it inside as well.

Apply it Methods

Three prisons

A psychologist wanted to find out if situational factors in prisons were responsible for aggressive behaviour. She identified three prisons with different regimes. In Prison A, inmates are frequently locked in their cells (lock-ups) with few educational opportunities. Prison B never uses lock-ups and there are many classes for inmates to choose from. Prison C is judged to be somewhere between Prisons A and B. The proportions of inmates committing acts of violence in the previous 12 months were: 37% in Prison A, 12% in Prison B, and 19% in Prison C.

Questions

1. Explain why the research method used in this study is classed as a **natural experiment**. (*2 marks*)
2. Explain *one* strength and *one* limitation of this research method. (*2 marks + 2 marks*)
3. Sketch a graph of the findings. Give it an appropriate title and label the axes carefully. (*3 marks*)
4. Identify the type of graph you have drawn. (*1 mark*)
5. Explain *one or more* **ethical issues** that the psychologists should have taken into account. (*4 marks*)

Check it

1. Outline **one** dispositional **and one** situational explanation of institutional aggression. *[3 marks + 3 marks]*
2. Outline what research has found about institutional aggression in the context of prisons. *[6 marks]*
3. Discuss explanations of institutional aggression in the context of prisons. *[16 marks]*

Media influences on aggression

The specification says...

Media influences on aggression, including the effects of computer games.

It is certainly true that images of aggression and violence frequently appear in all sorts of media, from children's cartoons to the latest Hollywood blockbuster. But does it necessarily follow that they can make us behave more aggressively?

We address this question on the next two spreads, starting with a look at the research.

Key terms

Media Communication channels, such as TV, film and books, through which news, entertainment, education and data are made available.

Computer games A game generally played on-screen using a keyboard, mouse or other controller. Types include simulations, first-person shooters, adventures, sports and role-playing games, often conducted using an online service.

Study tip

Be careful when you include criticisms of methodology as evaluation. You must link such criticisms explicitly to the context being discussed, in this case the effect of computer games on aggression. For instance, if correlational studies cannot let us draw conclusions about cause and effect, why is this a problem *in this context*? It's because we cannot conclude that playing violent computer games causes aggressive behaviour on the basis of these studies.



Concern about the effects of aggressive media is particularly acute when it comes to children's viewing habits.

Effects of TV and computer games

Excessive TV viewing

Aggressive behaviour may be linked to viewing 'excessive' amounts of TV, regardless of whether the content is violent or not. For example, Lindsay Robertson *et al.* (2013) measured the TV viewing hours of over 1000 New Zealanders at regular intervals up to the age of 26 years. The researchers found that time spent watching TV in childhood and adolescence was a reliable predictor of aggressive behaviour in early adulthood (defined as convictions for aggressive and violent crimes).

According to the researchers, excessive time spent watching TV is associated with reduced social interaction and poorer educational achievement. This means the link between excessive viewing and aggression may be indirect (due for example to reduced social interaction).

Violent film content

Viewing violent content is perhaps the most **significant** media influence on aggressive behaviour. Albert Bandura *et al.* (1963) followed up their earlier research (see page 302) by looking at the effects of aggression viewed on a screen. They **replicated** their earlier study, except that the children watched a film of the Bobo doll being beaten by an adult model.

The outcome was similar, with children imitating the aggressive behaviour of the model (and also of a cartoon version). The social learning processes identified by Bandura operate through media as well as face-to-face.

TV/film effects not strong

Other research has found that the negative effects of TV/film violence are not as strong as often assumed. Haejung Paik and George Comstock (1994) carried out a **meta-analysis** of about 200 studies. They found a significant **positive correlation** between viewing TV/film violence and antisocial behaviour.

However they estimated that TV/film violence probably only accounted for between 1% and 10% of the variance in children's aggressive behaviour. This implies a relatively minor role for TV and film compared with other sources of aggression.

Computer games

There is growing evidence that computer games (and video games) may have more powerful effects than traditional screen-based media. This is probably because:

- The player takes a more active role compared to a relatively passive viewer.
- Game-playing is more directly rewarding for the player (**operant conditioning**).

Lab experiments These have the advantage of demonstrating cause and effect, but an ethical disadvantage of deliberately exposing participants to violence to encourage aggressive behaviour. For this reason alternative measures of aggression are used.

For example, a standard lab measure is the *Taylor competitive reaction time task* (TCRTT). Participants deliver blasts of white noise at chosen volumes to punish a (non-existent) opponent. Bruce Bartholow and Craig Anderson (2002) found that students who played a violent computer game for ten minutes (Mortal Kombat) selected significantly higher volumes of white noise than students who played a non-violent golfing game (PGA Tour).

Correlational studies Other research methods have also been used, for instance correlational studies. A common finding is that several measures of aggression are positively correlated with time spent playing violent games (e.g. in juvenile offenders, DeLisi *et al.* 2013).

Matt DeLisi *et al.* argue that the link is so well-established that aggression should be considered a public health issue (like HIV/AIDS) and computer game violence a significant risk factor (like condom non-use).

Apply it Concepts

Playing games again

Olga and Jimmy are good friends, who both go to the local sixth-form college. Jimmy would like them to hang out together a bit more, but is getting a bit fed up of asking Olga for dates and getting knocked back. It turns out she would rather stay in and play computer games into the early hours. When Olga explains how aggressive and violent the games are, Jimmy doesn't like the sound of it and is concerned that it might affect her. Olga insists that it's all a laugh and there's nothing to worry about.

Question

Who is right? Use your knowledge of psychological research studies to justify your response.

Evaluation

Defining aggression

One limitation of research is that aggression is defined in various ways.

For example, the **dependent variable** in studies on this spread is violent behaviour (DeLisi *et al.*), volume of white noise blasted at an opponent (Bartholow and Anderson) and criminal convictions (Robertson *et al.*). However, violence and aggression are not exactly the same behaviour. All violence is aggression, but not all aggression is violence and not all aggression or violence is necessarily criminal. The effects found in studies depend very much on how aggression is defined.

This variation in definitions means that the findings of studies are hard to compare.

Counterpoint However, meta-analyses can help to overcome this problem. For instance, Craig Anderson *et al.* (2010) conducted a comprehensive meta-analysis which included 136 studies defining aggression in different ways (e.g. in terms of behaviours, thoughts and feelings). The researchers found that exposure to violent computer games was associated with increases in all outcome measures of aggression, for both women and men. Furthermore, the higher quality studies in the analysis showed an even greater significant effect.

Therefore, meta-analyses that include various definitions of aggression are a valid method for uncovering the effects of media on aggression.

Unsupported conclusions

Another limitation is that this research area is plagued by unsupported conclusions.

There are several reasons why we should maintain a sense of balance. First, many research studies are methodologically weak (e.g. confounding variables, poor sampling methods). Even meta-analyses are not perfect on the basis of GIGO (Garbage In Garbage Out) – if poor-quality studies are included, the analysis will also be poor-quality. Secondly, many studies are correlational so cause-and-effect conclusions are unjustified. Thirdly, experimental studies lack **external validity** (e.g. unrealistic measures of aggression), so findings cannot be generalised to the real world.

Therefore some researchers may be guilty of drawing premature conclusions based on findings that lack **validity**.

Explaining research findings

One strength is that findings can be explained using **social learning theory**.

Anderson *et al.* (2017) present SLT as a 'convincing theoretical framework' (as shown by the Bobo doll studies of Bandura *et al.*). They note that it is widely accepted that exposure to violence at home, for example, is harmful to children. Logically, it makes sense that TV and computer/video games are other sources of social learning. Children are more likely to imitate aggressive behaviours when they see them being rewarded (vicarious reinforcement), and even more so when children identify with on-screen characters.

This is a key feature of science – having a unifying explanation to account for findings, enhancing the validity of this research.

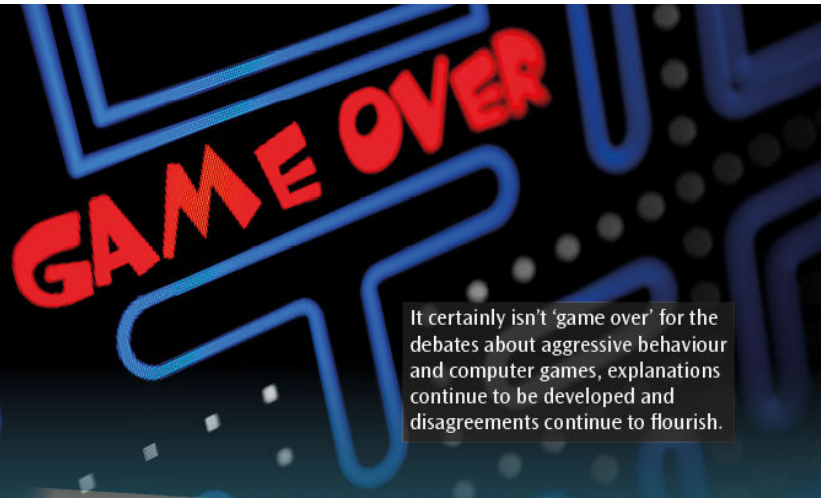
Evaluation eXtra

Research methods

Some psychologists point out that studies all have limitations related to their methodologies. These include lab-based and correlational studies. Such limitations make it difficult to claim that violent media causes aggressive behaviour.

However, we have also seen that this area has been researched by the full range of methodologies. Individual studies may be flawed but the strengths of one often compensate for the limitations of another (e.g. internal and external validity).

Consider: *Is it possible to come to a conclusion about the effects of media on aggression?*



It certainly isn't 'game over' for the debates about aggressive behaviour and computer games, explanations continue to be developed and disagreements continue to flourish.

Apply it Concepts — Getting critical

Two students are arguing in the college canteen about whether or not aggressive media can affect people's behaviour. As they are not psychology students, they are sadly not very well-informed, so the argument is mostly based on personal opinion. They both realise that some scientific evidence would help, so they decide to look at the research together. Unfortunately, their sources of information are not very evaluative, so they turn to you for help.

Question

Select *three* key points you would tell the two students about the strengths and limitations of the research evidence.

Apply it Methods — An aggressive correlation

A psychologist wanted to investigate the correlation between exposure to aggressive media and aggressive behaviour. She used opportunity sampling to recruit teenagers from a local college. They kept a diary of their TV viewing for a one-month period. Content analysis was used to derive an aggressive viewing score for each participant. This was correlated with teachers' rating of the participant's aggressive behaviour over the same period, on a scale from 0 (no aggression) to 10 (extreme aggression).

Questions

1. Explain how the psychologist could have carried out her **content analysis**. (*4 marks*)
2. The study gathered a lot of **qualitative data**. Explain what is meant by 'qualitative data'. (*2 marks*)
3. Outline *one* strength of gathering qualitative data in this study. (*2 marks*)
4. The psychologist wanted to calculate the average teacher rating of aggressive behaviour. Which **measure of central tendency** would you advise her to use, and why? (*1 mark + 2 marks*)
5. The psychologist decided to analyse her results using a **statistical test**. Identify the appropriate test for her to use and give *two* reasons for your choice. (*1 mark + 2 marks*)

Check it

1. In relation to aggression, explain what is meant by 'media influences'. *[2 marks]*
2. Outline what research has shown about media influences on aggression. *[6 marks]*
3. Describe **and** evaluate research into the effects of computer games on aggression. *[16 marks]*

Desensitisation, disinhibition and cognitive priming

The specification says...

Media influences on aggression. The role of desensitisation, disinhibition and cognitive priming.

Psychologists have formulated several explanations of how media aggression might influence aggressive behaviour. We look here at the roles of three factors which may account for the research that we explored in the previous spread. To put them into context, according to Nathan DeWall and Craig Anderson's (2011) *general aggression model*, no single factor on its own can explain all of the research. Therefore, desensitisation, disinhibition and cognitive priming all operate together – along with other influences – to explain the long-term effects of violent media on behaviour.

Key terms

Desensitisation Reduced sensitivity to a stimulus. This may be psychological (e.g. less emotional response) or physiological (e.g. lowered heart rate). This reduced response may make a behaviour such as aggression more likely.

Disinhibition A lack of restraint (no longer being inhibited). May be due to environmental triggers or overexposure to a stimulus, resulting in socially unacceptable behaviours becoming acceptable and therefore more likely.

Cognitive priming The way a person thinks (cognitive) is triggered by cues or 'scripts' which make us ready (primed) to respond in specific ways. For example, watching violent films provides a 'script' about how to react in certain situations so a person is more ready to respond in the same way.

Even if media violence does influence behaviour, it's only one of many sources of aggression. Here's another.



Role of desensitisation

Normally when we witness violent actions we experience physiological arousal associated with the **sympathetic nervous system**, such as increased heart rate, higher blood pressure and more sweating. But when children in particular repeatedly view aggression on TV or play violent computer games, they become used to its effects. So a stimulus that is usually aversive has a lesser impact, so anxiety and arousal become *lower* on repeated viewing or playing.

This **desensitisation** is psychological as well as physiological. Repeated exposure to violent **media** promotes a belief that using aggression as a method of resolving conflict is socially acceptable. Negative attitudes towards violence weaken, less empathy is felt for victims, and their injuries are minimised and dismissed (Funk *et al.* 2004).

A **laboratory** study which highlighted these desensitisation effects was conducted by Monica Weisz and Christopher Earls (1995). They showed their participants the feature film *Straw Dogs*, which contains a prolonged and graphic scene of rape. Participants then watched a re-enactment of a rape trial. Compared with those who watched a non-sexually violent film, male viewers of *Straw Dogs* showed greater acceptance of rape myths and sexual aggression. They also expressed less sympathy towards the rape victim in the trial, and were less likely to find the defendant guilty. There was no such effect of film type on female participants.

Role of disinhibition

Most people generally hold the view that violence and aggression are antisocial and harmful. So, there are strong social and psychological inhibitions against using aggression to resolve conflicts. These are learned by processes explained by **social learning theory** (SLT, see page 302). According to the **disinhibition** explanation, these usual restraints are loosened after exposure to violent media. Aggressive behaviour is often made to appear normative and socially sanctioned in such media, especially if portrayals minimise the effects of violence on its victims and suggest that it is justified. It is not unusual for video games to show violence being rewarded at the same time as its consequences are minimised or ignored. This creates new social norms in the viewer.

Role of cognitive priming

Repeated viewing of aggressive media, especially game playing, can provide us with a 'script' about how violent situations may 'play out'. According to Rowell Huesmann (1998), this script is stored in memory, and so we become 'ready' or primed to be aggressive. The process is mostly automatic, directing our behaviour without us even being aware of it. The script is triggered when we encounter cues in a situation that we perceive as aggressive.

A study by Peter Fischer and Tobias Greitemeyer (2006) illustrates the priming of aggressive scripts. They investigated a neglected form of media violence – song lyrics. Men listened to songs featuring aggressively derogatory lyrics about women. Compared with when they listened to neutral lyrics, participants subsequently recalled more negative qualities about women and behaved more aggressively towards a **confederate** who was a woman. This procedure was **replicated** with women as participants, using 'men-hating' song lyrics, with similar results.

Apply it Concepts

Selina gets educated

Selina is very concerned about her son's viewing habits. Arthur seems to spend a lot of his time downloading and watching the most gruesome films and programmes he can find. Selina is sure that she has noticed a change in Arthur's behaviour recently. He seems to be a lot more touchy, irritable and even angry on occasion. She is really worried that the things he watches are having a bad effect on him. They argue a lot about it, but Selina would like to know more.

Question

Selina is a friend of yours, and knows you are doing A level Psychology. She comes to you for advice, the kind of advice that will help her win the argument. You're happy to oblige. How could you use your knowledge of psychology to provide Selina with the arguments she needs to convince her son that watching violent media is not good for him?

Evaluation

Research support

One strength of the desensitisation explanation is research support.

Barbara Krahé *et al*. (2011) showed participants violent (and non-violent) films while measuring physiological arousal using **skin conductance** (see page 266). Participants who were habitual viewers of violent media showed lower levels of arousal as they watched the violent film clips. They also gave louder bursts of white noise (a measure of aggression) to a confederate without being provoked (proactive aggression).

This lower arousal in violent media users reflects desensitisation to the effects of violence, and it was also linked to greater willingness to be aggressive.

Alternative explanation

One limitation is that desensitisation cannot explain some aggression.

The study by Krahé *et al*. (above) failed to link media viewing, lower arousal and provoked (reactive) aggression. A more valid explanation for this might be **catharsis** (see page 300). This psychodynamic theory suggests that viewing violent media is a safety valve, allowing people to release aggressive impulses without behaving violently.

Therefore, not all aggression is the result of desensitisation and alternative explanations may be more **valid**.

Evaluation

Research support

One strength of the disinhibition explanation is research support.

Leonard Berkowitz and Joseph Alioto (1973) found that participants who saw a film depicting aggression as vengeance gave more (fake) electric shocks of longer duration to a confederate. Media violence may disinhibit aggressive behaviour if it is presented as justified and socially acceptable – as in the case of vengeance.

This demonstrates the link between removal of social constraints and subsequent aggressive behaviour.

Cartoon violence

Another strength of disinhibition is it can explain the effects of cartoon violence.

Children do not learn specific aggressive behaviours from cartoon models (it is not possible to punch someone so their head spins round 360 degrees, for example). Instead they learn that aggression in general is acceptable (socially normative). This is especially true if the cartoon model is not punished. This disinhibits aggressive behaviour.

Therefore disinhibition explains how cartoon aggression can lead to aggression in those who observe it.

Evaluation

Real-world application

One strength of cognitive priming is its real-world applications.

Whether real-world situations become violent often depends on how people interpret environmental cues. This in turn depends on the cognitive scripts they have stored in memory. Brad Bushman and Craig Anderson (2002) argue that someone who habitually watches violent media accesses stored aggressive scripts more readily. So they are more likely to interpret cues as aggressive and resort to a violent solution without considering the alternatives.

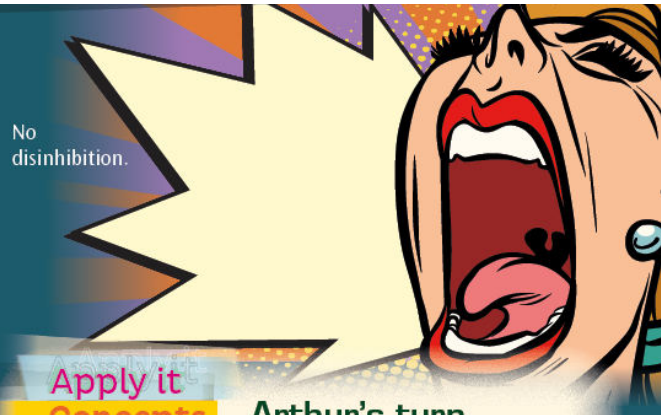
This suggests that interventions could potentially reduce aggressive behaviour by challenging hostile cognitive biases.

Confounding variables

One limitation of cognitive priming is **confounding variables** in research.

For example, research into the effects of video games has found that playing violent games primes violent behaviour more than non-violent games do. The problem is that violent games tend to be much more complex in their gameplay than non-violent games, and this complexity is a confounding variable (i.e. it is the complexity that causes the priming effect not the violence). David Zendle *et al*. (2018) found that when complexity was controlled, the priming effects of violent video games disappeared.

Therefore, the supportive findings of studies into priming may be at least partly due to confounding variables.



Apply it Concepts — Arthur's turn

Arthur gets home from college one day and is extremely surprised when his mum starts presenting him with all the arguments for why he should stop watching his beloved films. She certainly seems to have the facts at her fingertips, that's for sure. Unfortunately, he doesn't have any arguments he can use to come back at her with ... but he knows someone who has.

Question

As it happens, Arthur is also a good friend of yours. Funnily enough, he comes to you for some advice as well. Not wanting to appear unfriendly, you outline some arguments to support his point of view. Explain the psychological knowledge you would pass on to Arthur.

Apply it Methods — Experimental violence

A researcher recruited participants for a study investigating the effects of playing violent computer games on aggressive behaviour. Half of the participants were regular players of violent computer games. The other half did not play violent computer games on a regular basis. All the participants were shown a violent film clip while having their levels of physiological arousal measured using the skin conductance response (described on page 266). Statistical testing showed that arousal was significantly lower in the participants who were regular game players.

Questions

1. Write an appropriate **aim** for this study. (*2 marks*)
2. Identify *one* potential **confounding variable** and explain how it could have influenced the outcome of the study. *(1 mark + 2 marks)*
3. Explain how **investigator effects** might have influenced the study. (*2 marks*)
4. Identify and explain a **sampling method** the researchers could have used to recruit participants for this study. (*1 mark + 2 marks*)

Check it

1. In relation to media influences on aggression, explain what is meant by 'desensitisation', 'disinhibition' **and** 'cognitive priming'. *[2 marks + 2 marks + 2 marks]*
2. Outline research into the role of desensitisation in the media on aggression. *[4 marks]*
3. Outline research into the role of cognitive priming in the media on aggression. *[4 marks]*
4. Discuss media influences on aggression. Refer to desensitisation, disinhibition **and** cognitive priming in your answer. *[16 marks]*

Practical corner

The specification says...

> Knowledge and understanding of ... research methods, practical research skills and maths skills. These should be developed through ... ethical practical research activities.

This means you should conduct practical activities wherever possible. But there are serious ethical risks involved in investigating any aspect of aggressive behaviour. Even asking people to consider how aggressive they are or have been raises issues of privacy and protection from harm. The two activities on this spread will give you a chance to develop your practical skills further while thinking carefully about the ethical context in which research is conducted.

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?



Is this man's yawn a sign of tiredness, or is he trying to communicate a more aggressive and hostile message to his colleagues? Will they respond in kind? And are you feeling the urge to yawn?

Practical idea 1: Observing fixed action patterns

A widespread fixed action pattern (FAP) in humans is yawning. Various theories have been proposed to explain why we yawn, but there is no scientific agreement as to its function. One possibility is that yawning in humans is a passive-aggressive way of displaying hostility or rejection. Yawning is certainly considered antisocial in most cultures, which is why it's usually polite to hide it from view.

Given that yawning could be viewed as an aggressive behaviour, the aim of this study is to investigate it from an **ethological** perspective by observing how contagious it is.

The practical bit

There are two ways you could provoke a yawn in your participants. You could use a **confederate**, someone able to produce a convincing yawn. Alternatively, your participants could watch a video clip of someone yawning. There are plenty of possibilities available on the internet, or you could produce your own. The benefit of the video option is that you know for sure that your participants have noticed the yawn. This isn't guaranteed in a 'live' situation, and risks introducing **confounding variables** such as having to yawn more than once or more loudly. Whichever method you choose, you should simply keep a record of whether or not each participant yawns in response to the confederate/video.

As it stands, this activity is just an **observation** with little scientific rigour. To turn it into a true **experiment**, you will need a comparable **control condition** using different participants. Perhaps a confederate (or video clip of someone) who merely opens their mouth without actually yawning would be suitable (a kind of '**placebo** yawn').

Variations

Think about what conditions you could vary to test the **hypothesis** that a yawn is an aggressive act. For instance, does the likelihood of the participant yawning depend on the number of people present? You could alter the number of confederates who yawn one at a time. What about gender differences? Is the situation with a confederate and a participant who are both men the one most likely to produce a yawn? How does this compare with other combinations? A FAP is a behaviour that is always seen through to completion, so a yawn requires a huge effort to stop once it has begun. You could assess how difficult participants find it to stifle a yawn, perhaps by measuring its extent. Is it accompanied by stretching (technically called *pandiculation*) or an audible noise? How long does it last?

Demand characteristics

Demand characteristics are potentially very influential in this study ('Why am I watching someone yawning?'). You don't want to give the game away, so you will need a pretext ('cover story') to recruit your participants. If you are too vague about what you want them to do ('Take part in a psychology study'), your participants will probably just ask you for more details anyway. Once you have used your cover story and recruited a participant, you would take them to a room to wait for the 'study' to begin. This room should contain either another person (your confederate) or a means of showing a video clip (laptop, tablet, etc.). You should make sure you are in a position to observe the participants' behaviour.

Ethical issues

Clearly, a small degree of **deception** is necessary for this procedure to work. This has implications for **informed consent** and **debriefing**. It is your responsibility to make sure that the consequences of the deception are harmless (e.g. your cover story should be as close to the truth as possible). Consider how you could get **prior general consent** before the study begins (be honest with your participants about what you can and cannot tell them). What will you tell them in the debriefing?

Analysing your data

If you have followed the basic procedure outlined above, then you should have figures for the numbers of participants who did or did not yawn, in both conditions. You could calculate each as a percentage of the overall number of participants. You can analyse your findings for **significance**.

Apply it

Methods

The maths bit 1

Table 1 Contingency table of the numbers of participants who yawned and did not yawn.

	Yawn	No yawn
Yawn video	9	6
'Placebo' yawn	5	10

1. In Table 1, what is the **level of measurement** of the variable indicating whether participants yawned or did not yawn? Explain your answer (*1 mark + 1 mark*)
2. Identify the appropriate **statistical test** to use to analyse the data. Explain your choice. (*1 mark + 3 marks*)
3. Calculate the statistical test you have identified to obtain a **calculated value**. State whether or not the outcome is significant and explain how you made this decision. (*1 mark + 3 marks*)
4. What is meant by a **Type I error** and **Type II error** in the context of this study? (*4 marks*)

Practical idea 2: Sensitivity to cuckoldry

Because of the **ethical** difficulties inherent in studying aggression, this activity focuses on a closely linked evolutionary concept – fear of cuckoldry. A woman who gives birth can be 100% sure the baby is hers (obviously). But men do not have this degree of certainty. The possibility that a man might raise a child who does not share his **genes** is a powerful motivator of sexual jealousy and ultimately aggression towards his partner and potential rivals.

The aim of this activity is to test the prediction that men are sensitive to the possibility of cuckoldry.

The practical bit

'Awww, doesn't he look like his dad? He's the spitting image, he's got his nose and everything.' These are the sort of comments often heard upon the arrival of a new baby, intended to reassure the father of his paternity. If it is **adaptive** for men to recognise the signs of cuckoldry, are they especially good at spotting facial similarities between fathers and their offspring? We could test this by seeing if men are more accurate than women at matching images of fathers and their children.

Devising materials

This is by far the most challenging part of this activity. You will need a number of pictures of a father with son. The pictures should be similar in terms of the way each individual presents themselves (see below) and also you will need to cut the pictures up so you just have the father and the son as two separate pictures (so they can't be hugging).

There are many such images available on the internet. But a major problem with many of them is that we cannot guarantee that the man and the child are genetically related (e.g. in advertising or publicity images). There is a better solution which requires a lot more effort but is worth it. You could either borrow such images from friends and family, or take your own pictures. Ten should be enough for this practical.

Designing the study

As you are comparing responses from men and women, this is a **quasi-experiment** with gender as the **independent variable**. The **dependent variable** is the number of correct matches. There are several ways to control potentially confounding variables.

Try your best to make sure it's not possible to tell (e.g. from backgrounds, or size of picture) which child goes with which father. On this occasion, use images of fathers and sons rather than daughters. It also helps if all the individuals are the same ethnicity and roughly the same age. You may be able to think of other factors – apart from gender – that make some participants better at this task (such as experience). The more effort you make to **control** these variables, the more **valid** the activity becomes (and your findings and conclusions).

Ethical considerations

If you collect images from family or friends, or produce your own, you should be extremely sensitive to issues of **privacy** and **confidentiality**. This is also true in relation to your participants. You are investigating a **hypothesis** with serious implications, which include the possibility that some fathers and sons are not biologically related after all. In this situation, it is absolutely vital that you obtain fully **informed consent** from whoever provides you with photos and take every possible step to reduce the possibility of distress, embarrassment and invasion of privacy.

Analysing your data

Your data will be the number of correct matches for each participant. You could then calculate various **descriptive statistics** for men and women separately: percentage of correct matches, a **measure of central tendency** to find the average for each gender, and a suitable measure of dispersion (see The maths bit 2). You should also consider the most appropriate graphical representation. Finally, a suitable **statistical test** will tell you whether or not men are significantly more accurate than women in correctly matching fathers and sons.



Can you see any resemblance between this father and his son? If men are better at spotting these similarities, does that show they are sensitive to the possibility of being cuckolded?

The maths bit

Overall, at least 10% of the marks in assessments for Psychology will require the use of mathematical skills and this is included in the requirement that at least 25–30% in total will involve research methods.

Don't avoid it!

Apply it
Methods

The maths bit 2

1. State a suitable **hypothesis** for this study. (*2 marks*)
2. Which is the appropriate **measure of central tendency** to use to summarise the data below? Give *one* reason for your choice. (*1 mark + 1 mark*)
3. Which is the appropriate **measure of dispersion** to use? Give *one* reason for your choice. (*1 mark + 1 mark*)
4. Calculate the descriptive statistics you identified in questions 2 and 3 for men and women separately. Draw up a table to present these statistics. (*4 marks + 3 marks*)
5. Which statistical test is the most suitable to analyse the results? Give *three* reasons for your choice. (*1 mark + 3 marks*)
6. Apply the test you identified in question 5 to obtain a **calculated value**. Is the result significant or not? Explain your answer. (*1 mark + 3 marks*)

Table 2 Number of correct matches made by male and female participants.

Participant	Gender	Correct matches
1	Man	6
2	Man	4
3	Man	7
4	Man	6
5	Man	5
6	Woman	3
7	Woman	5
8	Woman	2
9	Woman	1
10	Woman	4

Revision summaries

Neural and hormonal mechanisms in aggression

How our biology contributes to aggressive behaviour.

Neural mechanisms

The limbic system
Includes hypothalamus, hippocampus, amygdala, linked to emotion/aggression by Papez and Maclean.
Reactive aggression linked to amygdala (Gospic *et al.*).

Orbitofrontal cortex and serotonin
Low levels disrupt OFC, reduced self-control (Denson *et al.*), impulsive crime (Virkkunen *et al.*).

Evaluation

Other brain structures
Non-limbic OFC, reduced activity disrupts impulse control, increasing aggression (Coccaro *et al.*).

Drugs and serotonin
Participants who took *paroxetine* gave fewer shocks than placebo group (Berman *et al.*).

Evaluation extra: Direct or indirect?
Neural factors may be directly linked (e.g. serotonin), or may be indirect (e.g. social).

Hormonal mechanisms

Testosterone
Increased testosterone linked with aggression in human offenders (Dolan *et al.*) and castrated mammals (Giammanco *et al.*).

Progesterone
Low levels linked to higher aggression in women (Ziomkiewicz *et al.*).

Evaluation

Animal research
Testosterone and aggression higher in mating season (male monkeys), mouse-killing lower in castrated male rats and higher in female rats given testosterone (Giammanco *et al.*).

Dual-hormone hypothesis
Testosterone leads to aggression only when cortisol is low (Carré and Mehta).

Evaluation extra: Animal research
Hormonal mechanisms similar in humans and other mammals, but aggression more complex in humans (e.g. cortisol and cognitive factors).

Genetic factors in aggression

Are we born to behave aggressively?

Genetic factors

Twin studies
Concordance rates for physical assault – 50% for MZs, 19% for DZs (Coccaro *et al.*).

Adoption studies
Meta-analysis showed 41% genetic factors (Rhee and Waldman).

The MAOA gene
MAOA gene → MAO-A enzyme → regulates serotonin. MAOA-L → higher aggression.
Warrior gene – MAOA-L in 56% of male Maoris and 34% Caucasians (Lea and Chambers).
Dutch family – violence linked to low MAO-A enzyme and MAOA-L variant (Brunner *et al.*).

G×E interactions
MAOA-L only linked with aggression when combined with early trauma (Frazzetto *et al.*).

Evaluation

Research support
High-activity MAOA variant associated with less aggression in male participants, supports MAOA gene–aggression link (Mertins *et al.*).
Counterpoint – even Mertins *et al.*'s low-activity MAOA participants behaved co-operatively when they knew others were being co-operative.

Complex link
Research shows low serotonin linked with higher aggression but in MAOA-L people we expect serotonin to be high, may be 'disruption'.

Problems with twin studies
Equal environments assumption may be wrong, MZs treated more similarly (e.g. parents praise aggression equally).

Evaluation extra: Nature and nurture
Genes directly cause aggression (twin studies, MAOA research, animal studies). But environment is important (criticisms of twin studies, early trauma affects gene expression).

The ethological explanation of aggression

The aggressive instinct in humans and other animals.

The explanation

Adaptive functions of aggression
Aggression forces animals into different territories reducing pressure on resources. Also establishes dominance in social groups.

Ritualistic aggression
Appeasement displays by loser inhibit physical damage from victor, adaptive for survival of species.

IRMs and FAPs
IRM – inbuilt physiological structure/process (e.g. brain circuit) that triggers FAP.
FAP – stereotyped, universal, ballistic, single-purpose sequence of behaviours (e.g. aggressive attack) (Lea).

Tinbergen's research
Procedure – male sticklebacks saw wooden model of varying shapes.
Findings – males were aggressive if model had red spot even if not stickleback-shaped (stimulus activated IRM, IRM triggered FAP).

Evaluation

Research support
Research shows aggression is genetic (e.g. twin studies, Brunner *et al.*) and adaptive (Wilson and Daly).
Counterpoint – 'culture of honour' homocides in southern US, culture overrides innate influences (Nisbett).

Ritualistic aggression
Systematic same-species killing by chimps despite appeasement signals, not self-limiting (Goodall).

FAPs are not fixed
Behaviours in aggressive FAP vary between individuals/situations, i.e. modified by experience (Hunt).

Evaluation extra: Born to be aggressive?
Aggression is an instinct so people inevitably fight each other (e.g. FAPs), but human aggression is affected by cognitive, learning and social factors.

Evolutionary explanations of human aggression

Aggression as a way of enhancing reproductive success.

The explanation

Evolutionary explanations of sexual jealousy
Sexual jealousy is greater in men because it evolved as a defence against cuckoldry, drives aggressive strategies to retain mates.
Mate retention strategies – direct guarding and negative inducements (Wilson and Daly).
Physical violence against partner – more likely when men use mate retention strategies (Wilson *et al.*).

Evolutionary explanation of bullying
Adaptive for bullies, increases reproductive success.
Male bullying – adaptive, signals desirable characteristics for females, e.g. dominance (Volk *et al.*) and improves bully's health (Sapolsky).
Female bullying – adaptive, because secures partner's fidelity and resources for offspring.

Evaluation

Gender differences
Women using physical aggression risk offspring's survival, so use verbal aggression to retain resource-providing partner (Campbell).

Cultural differences
!Kung San discourage aggression from childhood, linked to loss of status, shows it is not universal/adaptive (Thomas).
Counterpoint – !Kung not that 'peaceable', high homicide (Lee), different observation due to e.g. observer bias.

Real-world application
Bullying is advantageous for the bully, so 'meaningful roles' approach increases costs and rewards of prosocial alternatives (Ellis *et al.*).

Evaluation extra: Determinism versus free will
Evolutionary argument suggests aggression is inevitable, but humanistic approach argues aggression is about free will, plus cognitive and social factors involved.

Institutional aggression in

Prisons – aggressive person or aggressive situation?

Dispositional explanation

The importation model
Prisoners bring their criminal attitudes and aggressive behaviours into the prison. They would be aggressive in any situation (Irwin and Cressey).

Prisoner characteristics linked to outcomes
Offenders imported negative characteristics (e.g. trauma, anger) into prisons, more likely to be physically aggressive (DeLisi *et al.*).

Evaluation

Research support
No difference in aggression between low- and high-security prisons (33% versus 36%), inmate characteristics more important (Camp and Gaes).

Ignores key factors
How prison run, weak leadership, unofficial rules = administrative control model (Dilulio).

Evaluation extra: Determinism and free will
Importation model determinist, prisoners have little or no control over dispositions. But prison aggression is outcome of prisoners exercising free will.

Social psychological explanations of aggression

Frustration-aggression hypothesis

Frustration and aggression always go together.

The explanation

The original hypothesis
If a goal is blocked this creates frustration, which is relieved by aggression which may be displaced onto an innocent target – a cathartic experience (Dollard *et al.*).

The weapon effect
Frustration alone may not be enough. Students given electric shocks (frustration), gave stronger (fake) shocks to confederate when guns were present (Berkowitz and LaPage).

Research on frustration-aggression
Procedure – students doing jigsaw, impossible or confederate annoyed/insulted them (Geen).
Findings – most frustrated students gave strongest electric shocks.

Evaluation

Research support
Meta-analysis showed aggression is displaced against weaker and more available targets (Marcus-Newhall *et al.*).

Role of catharsis
People who hit a punchbag became more aggressive not less, even doing nothing reduced aggression more than venting (Bushman).

Frustration-aggression link
Frustration does not always lead to aggression, aggression can occur without frustration (not automatic).
Counterpoint – negative affect theory, aggression caused by range of negative feelings (affect), frustration leads to many behaviours (Berkowitz).

Evaluation extra: Gun control
'The finger pulls the trigger', 'open carry' does not cause violence. But 'trigger may be pulling the finger', open presence of a gun is a cue.

Social learning theory

How we learn to be aggressive directly and indirectly.

The explanation

Direct and indirect learning
Operant conditioning (direct) and observational learning (indirect).

Observational learning and vicarious reinforcement
Children learn that aggression is effective when they observe models being rewarded for behaving aggressively.

Cognitive conditions for learning
Attention, retention, reproduction and motivation.

Self-efficacy
Aggression successful in the past and therefore expect it to continue to be rewarding.

Bandura *et al.*'s research
Procedure – young children observed adult model with Bobo doll.
Findings – very close imitation of model's aggression (e.g. same words), boys more likely to imitate physical aggression and to imitate same-sex model.

Evaluation

Research support
Friends model proactive aggression to each other, positive consequences and belonging to gang are reinforcing (Poulin and Boivin).
Counterpoint – no similarity between friends for reactive aggression, so limited explanation.

Real-world application
Reduce aggression through friendships with children rewarded for non-aggression (and media characters).

Biological influences
Bandura recognised biology (aggressive instinct) but SLT emphasises nurture and underplays genetic/hormonal influences.

Evaluation extra: Research methods
Studies use controlled conditions so can establish causes, but studies are unlike real world ('ideal' conditions and demand characteristics).

De-individuation

We become aggressive when in a crowd.

The explanation

Crowd behaviour
Loss of self-identity and responsibility in crowd, ignoring social norms against aggression (Le Bon).

De-individuation and aggression
De-individuated state in crowds, loss of self-awareness, ignore social norms (Zimbardo), feel anonymous (Dixon and Mahendran).

Reduced self-awareness
Private and public self-awareness reduced in crowds e.g. less attention to own feelings, less accountable for aggressive acts (Prentice-Dunn and Rogers).

Research on de-individuation
Procedure – Dodd asked 200+ students to list what they would do if they could never be found out.
Findings – 36% responses were antisocial behaviour, 26% criminal acts, only 9% prosocial.

Evaluation

Research support
Most aggressive messages posted online by people hiding identities (Douglas and McGarty).
Counterpoint – strangers in darkened room were not aggressive but touched/kissed (Gergen *et al.*).

Real-world de-individuation
Considered 21 suicidal 'jumpers', aggressive 'baiting' by de-individuated crowds e.g. dark and distanced (Mann).

Role of norms
SIDE model, de-individuation leads to conformity to group norms rather than ignoring them (Spears and Lea).

Evaluation extra: Nature and nurture
De-individuation highlights nurture (e.g. effects of crowds on behaviour), but nature plays a role (e.g. crowding leads to stress and aggression).

the context of prisons

Situational explanation

The deprivation model
Psychological (e.g. freedom) and physical (e.g. goods) deprivation, worst with unpredictable regime (Clemmer).

Prison-level factors linked to outcomes
More women staff, African-American and Hispanic inmates, more protective custody predicted aggression in 512 US prisons (Steiner).

Evaluation

Research support
Inmate homicides motivated by prison deprivations e.g. arguments over possessions, drugs (Cunningham *et al.*).

Contradictory research
Study of Mississippi prisons, conjugal visits (a situational factor) not linked to reduced aggression (Hensley *et al.*).

Evaluation extra: Importation versus deprivation
Importation model supported by controlled experiments (e.g. Camp and Gaes). But evidence for deprivation model has other strengths (e.g. wide range of prisons, Steiner).

Media influences on aggression

Effects of TV and computer games

Can violent media make us aggressive?

Research

Excessive TV viewing
Time watching TV in childhood reliably predicts aggressive adult criminal convictions (Robertson *et al.*).

Violent film content
Children closely imitated filmed adult models beating Bobo doll, social learning (Bandura *et al.*).

TV/film effects not strong
Positive correlation but only 1–10% of variance in children's aggression due to media (Paik and Comstock).

Computer games
Lab experiments – white noise volume higher after playing violent computer game (Bartholow and Anderson).
Correlational studies – positive correlation between time spent playing violent games and aggression, serious public health issue (DeLisi *et al.*).

Evaluation

Defining aggression
Various dependent variables (violent behaviour, white noise, crime), hard to compare.
Counterpoint – meta-analyses help by including studies using different definitions, demonstrate a strong effect of computer game violence (e.g. Anderson *et al.*).

Unsupported conclusions
Many studies are methodologically weak (e.g. GIGO), correlational, lack validity, so premature conclusions.

Explaining research findings
Can use social learning theory to explain findings, which enhances validity of this research (Anderson *et al.*).

Evaluation extra: Research methods
Methodological limitations mean causal conclusions not justified, but full range of methodologies, strengths compensate for limitations.

Other influences

Reduced sensitivity, reduced inhibitions, mental triggers.

Desensitisation

Repeatedly viewing or playing violent media leads to reduced arousal (physiological), less empathy, acceptance of violence (psychological).

Evaluation

Research support
Lower arousal in people who often watched violence, more aggression later (Krahé *et al.*).

Alternative explanation
Media viewing not linked to reactive aggression, catharsis explains better.

Disinhibition

Learned social inhibitions against aggression loosened by repeated exposure to (rewarded) violent media, creating new social norms.

Evaluation

Research support
Film showed aggression as vengeance (socially acceptable), more shocks given (Berkowitz and Alioto).

Cartoon violence
Children learn aggression is socially normative if unpunished (don't learn specific behaviours).

Cognitive priming

Exposure to violent media provides a 'script' stored in memory, triggered when we perceive aggressive cues (e.g. song lyrics).

Evaluation

Real-world application
People who watch violent media store aggressive scripts, can be challenged (Bushman and Anderson).

Confounding variables
Violent gameplay more complex than non-violent, no priming if complexity controlled (Zendle *et al.*).

Practice questions, answers and feedback

Question 1 Outline the roles of the limbic system **and** serotonin in aggression. (*4 marks*)	
Morticia's answer *The limbic system and serotonin are both aspects of aggression that are related to brain activity. The limbic system is in the brain and is a group of structures such as the amygdala.* *Serotonin affects the synapses in neurons in the brain. Low levels of serotonin are associated with aggressive behaviour. It is related to self-control so some people lack self-control.*	The reference to the amygdala in the first half of Morticia's answer is relevant but the point is not explicitly linked to aggression. The material on serotonin is better with the reference to self-control – but overall a weak response.
Luke's answer *The limbic system contains the amygdala and there is a strong link between amygdala activity and reactive aggression.* *Denson et al. found that decreased levels of serotonin are associated with more impulsive aggression.*	A much better use of the amygdala link here from Luke and the Denson study is relevant. The answer lacks sufficient detail.
Vladimir's answer *Both of these play a role in aggression. The limbic system is a subcortical set of structures in the brain, including the hypothalamus. It is regarded as one of the main areas of the brain controlling aggressive behaviour.* *The role of serotonin is generally to dampen down activity in the brain so low levels mean that there is less control.*	A reasonable answer from Vladimir. Again, additional detail related to aggression for either point would have been useful but the answer is informed and accurate.

Question 2 Asif often sees different species of bird in his garden, including robins. One day, he noticed two robins appearing to square up to each other. One in particular was making a lot of noise, flapping its wings, sticking its chest out, and making head-down charging gestures at the other. Using your knowledge of ethological explanations of aggression, explain the behaviour of the robins. (*4 marks*)	
Morticia's answer *This aggressive behaviour by the robins must have some adaptive value, that's what ethologists would argue. They said that the main function of aggression was to enhance survival. It is not intended to kill another animal but to encourage the other animal to move away and thus disperse the species.* *Alternatively, aggression helps create dominance hierarchies, which is also adaptive because of the benefits an individual gets by being dominant.*	Morticia's answer includes knowledge and understanding of ethological explanations (reference to adaptive value and dominance hierarchies in particular) but the reference to the stem is limited. The description is relevant but there is no application.
Luke's answer *Both of the robins are obviously engaging in some ritualistic behaviour and are using it to signal aggression. But neither of them are actually doing any attacking. They are displaying their intentions. This is good for survival and therefore is adaptive.* *Ethologists explain this kind of behaviour as a confrontation, which avoids causing damage because overall that is better for both individuals. Even the animal that wins a contest may be wounded if they start attacking each other so rituals evolve where one animal can display its superiority such as sticking out his chest which shows his size.* *One of the robins will back down, recognising that the other is more powerful.* *Not all research supports the fact that encounters like this do not result in harm.*	Luke presents the necessary knowledge and understanding in his reference to adaptive value and ritualistic behaviour. Luke has demonstrated a thorough engagement with the scenario in the stem. His knowledge is successfully and effectively linked to the robins' behaviour. The final sentence is not necessary.
Vladimir's answer *This could be an innate releasing mechanism. Such mechanisms are an inbuilt physiological process or structure.* *An environmental stimulus (such as a certain facial expression) triggers the IRM which then 'releases' a specific sequence of behaviours. This behavioural sequence is called a fixed action pattern (FAP). So we could be seeing a fixed action pattern here. Such patterns are stereotyped, universal, unaffected by learning, ballistic, single-purpose and a response to a releaser. It is a form of adaptive behaviour.*	In many ways, this is a similar answer to the one offered by Morticia. If anything, the knowledge of ethological explanations is more impressive here – a highly sophisticated account of the processes involved in innate releasing mechanisms. Again though, the application is very limited – the phrase 'we could be seeing a fixed action pattern here' contributes nothing to the application.

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

Question 3 Describe **and** evaluate **two** social psychological explanations of human aggression. (*16 marks*)

Morticia's answer *The two social psychological explanations I am going to describe are frustration–aggression hypothesis and social learning theory, and I will evaluate each of them.*

Frustration-aggression theory (Dollard) proposes that frustration always leads to aggression, and aggression is always the result of frustration. This theory was developed from the psychodynamic idea of catharsis – that if a person experiences a drive that is blocked (i.e. they are frustrated) then they have to express the drive and this produces aggression.

There is research support for this explanation. For example, one meta-analysis of almost 50 studies of displaced aggression that all found that people did displace their aggressive feelings on to something other than the original target which supports frustration-aggression. In contrast other research suggests that people actually don't get a sense of relief when they displace their aggression. Bushman found that when people repeatedly were hitting a punchbag they actually got even more angry rather than less angry. Another issue for frustration-aggression hypothesis is that the frustration-aggression link is not automatic. Frustration does not always lead to aggression and aggression is not always the result of frustration. This means the frustration-aggression hypothesis only explains aggression in some situations. This led Berkowitz to come up with the negative affect theory. Frustration is just one of many negative feelings that lead to aggression. Others are jealousy, pain and loneliness. Also, the negative feelings can produce behaviours other than aggression. So someone who gets a bad grade might become helpless or determined rather than aggressive. This shows how frustration does fit into a wider explanation of aggression.

The second theory I am going to describe is social learning theory (Bandura). This theory suggests that people behave aggressively because they have observed others behaving like this and being rewarded for it (vicarious reinforcement). This leads people to imitate such behaviour, especially behaviour they have seen on TV or in films.

This theory clearly explains many examples of aggression and there is research support, such as Bandura's Bobo doll study where young children imitated specific actions they observed performed by a role model and also just behaved more aggressively than children who didn't observe the model. In a real-life analysis by Poulin and Boivin they observed friendship groups of young boys who reinforced aggressive behaviour in each other. However, this explanation doesn't explain all kinds of aggression – it is less good for the kind of reactive, in-the-heat-of-the-moment aggression which may actually be better explained by frustration-aggression.

(410 words)

Morticia could have dispensed with the introduction and started the essay with paragraph 2 – a clear and concise summary.

The meta-analysis described in paragraph 3 is a genuine study (by Marcus-Newhall *et al.*) but the details are somewhat lacking. Later in this paragraph there is good use of evidence as counterargument here (In contrast ...) and finally a fairly lengthy description of Berkowitz's reformulation. Overall this evaluation is mostly effective and well-organised, and sufficient as more than one theory is being evaluated.

The second explanation covered is SLT – a rather short summary. One or two concrete examples might have brought the explanation 'to life' a bit more.

The answer ends with a very popular study to cite (the Bobo doll) – but relevant.

Some pertinent critical points to finish. A well-organised account, with slightly better evaluation than description.

Luke's answer *Social learning theory was proposed by Albert Bandura in the 1960s. He did a study with a Bobo doll where very young children watched an adult who hit the Bobo doll and said things like 'Pow'. Later the children were observed while they played with some toys including a Bobo doll. The children who had observed the aggressive model behaved more aggressively in general and also imitated specific things they saw or heard. This shows that aggression can be learned by watching someone else behave aggressively.*

The trouble with this study is that it was in a lab and it was just a doll that they were hitting so the study lacks ecological validity because it was very artificial and not like everyday life. We can't really generalise the results because of this.

Another thing was that children were involved in this study and they are more impressionable than adults so it may explain their learning aggression but adults may not be as impressionable. So it may just be an explanation that applies to children and in fact the children in Bandura's study were very young. Older people may have more free will and can make decisions about whether to imitate behaviour.

There are real-world applications of this theory because it suggests that children shouldn't be exposed to aggressive role models in cartoons and films because they might imitate such behaviour, especially when they see someone they admire behaving in this way. Some people say that cartoon violence doesn't have any effect but I don't think this is true.

Another real-world application is using the idea to reduce aggressiveness by exposing people to non-violent role models, especially showing this on TV programmes that young children watch. You could have people being kind to each other or examples of how someone responded to an aggressive situation by being non-aggressive and then children might imitate this.

This research may be gender- and culture-biased because it is conducted in America where people are more violent. In fact it may be difficult to generalise this study to everyday life because it is based on laboratory research such as the Bobo doll studies. Children in such studies may have guessed what the study was about and behaved in a way they thought they were expected to behave.

There are other social theories of aggression such as frustration-aggression. This suggests that people are aggressive when they feel frustrated. In fact in the Bobo doll study they frustrated the children before showing them the toys so this study supports the frustration-aggression hypothesis.

(425 words)

A common failing is shown here in Luke's answer – launching straight into the evidence when the explanation is the focus of the question.

This is followed by a fairly generic methodological evaluation that doesn't really add to a discussion of the theory.

In paragraph 3 there is an attempt to broaden this point out and make it a little more theoretical, which just about stands up.

In paragraph 4 there is a good evaluation point that is well-expanded but spoilt slightly by the anecdotal reference at the end. This is followed by another rather anecdotal critical point – a specific study to illustrate the point would be better.

Some limited evaluation in the penultimate paragraph and finally the introduction of a second explanation but this is only a very brief reference.

A flawed essay. The second explanation is almost entirely missing, and the first explanation (SLT) is simply a description of the study rather than an explanation. A good amount of evaluation is provided, though not always well-elaborated.

Multiple-choice questions

Neural and hormonal mechanisms in aggression

1. **The most important part of the limbic system involved in aggression is the:**
   (a) Hypothalamus.
   (b) Hippocampus.
   (c) Amygdala.
   (d) Thalamus.

2. **Decreased levels of serotonin are linked with aggression because:**
   (a) Self-control is increased.
   (b) Impulsive behaviours generally are increased.
   (c) Serotonin speeds up neuronal activity.
   (d) Levels of *5-HIAA* in cerebrospinal fluid are high.

3. **Research with violent offenders by Dolan *et al.* found a positive correlation between aggression and:**
   (a) Serotonin levels.
   (b) Amygdala activity.
   (c) Testosterone levels.
   (d) *5-HIAA* levels.

4. **The dual-hormone hypothesis suggests the involvement in aggression of:**
   (a) Testosterone and adrenaline.
   (b) Testosterone and noradrenaline.
   (c) Testosterone and cortisol.
   (d) Adrenaline and cortisol.

Genetic factors in aggression

1. **The proportion of aggressive behaviour accounted for by genetics seems to be:**
   (a) Significantly more than 50%.
   (b) About 50%.
   (c) 27%.
   (d) Very unclear.

2. **The MAOA gene:**
   (a) Controls the production of the *monoamine oxidase A* enzyme.
   (b) Determines the amount of testosterone in the body.
   (c) Operates identically in every individual.
   (d) Determines the activity of the amygdala.

3. **Mertins *et al.* found that people with MAOA-H gene variant:**
   (a) Were extremely aggressive.
   (b) Never co-operated in a money-distributing game.
   (c) Were less aggressive than people with MAOA-L.
   (d) Were just as aggressive as people with MAOA-L.

4. **The best way to consider the effect of MAOA-L is that it causes serotonin levels to be:**
   (a) Disrupted.
   (b) Lower.
   (c) Higher.
   (d) Variable.



The ethological explanation of aggression

1. **An important adaptive function of aggression is to:**
   (a) Kill potential competitors.
   (b) Make sure every animal has a similar status within the group.
   (c) Establish dominance hierarchies.
   (d) Distribute access to fertile females equally.

2. **An innate releasing mechanism is:**
   (a) A collection of stereotyped aggressive behaviours.
   (b) An environmental stimulus that triggers a fixed action pattern.
   (c) A response that is learned through experience.
   (d) A biological structure or process.

3. **One feature of a fixed action pattern is that it:**
   (a) Can be found in the brain.
   (b) Responds directly to an environmental stimulus.
   (c) Follows a predictable sequence that is always completed.
   (d) Occurs in many different situations.

4. **The ethological explanation of aggression is supported by research that shows:**
   (a) Aggression is mostly influenced by cultural factors.
   (b) Genetic and neural mechanisms are major influences on aggression.
   (c) Non-human animals frequently use aggression to kill.
   (d) IRMs have little influence on behaviour.

Evolutionary explanations of human aggression

1. **Sexual jealousy is stronger in males because:**
   (a) Females are more likely to be unfaithful.
   (b) Females make a greater investment in offspring.
   (c) They face the possibility of cuckoldry.
   (d) They can always be sure of their paternity.

2. **An aggressive mate retention strategy commonly used by males is:**
   (a) Negative inducements.
   (b) Romantic gestures.
   (c) Sexual favours.
   (d) Providing resources.

3. **Bullying is adaptive for a male mainly because:**
   (a) It ensures his partner continues to provide resources.
   (b) It increases the possibility of cuckoldry.
   (c) Females are more sexually jealous than males.
   (d) It gives him more mating opportunities.

4. **Females are generally less physically aggressive than males because:**
   (a) Verbal aggression is a more adaptive behaviour for males.
   (b) Men are physically stronger than women.
   (c) Males invest more resources in offspring than females.
   (d) Female involvement in physical aggression is risky for their offspring.

Social psychological explanations of aggression: Frustration-aggression hypothesis

1. **Aggression is cathartic because:**
   (a) It is always the result of frustration.
   (b) Behaving aggressively reduces the drive to be aggressive.
   (c) It is not always expressed against the true source of frustration.
   (d) Violent fantasies make us even more angry and aggressive.

2. **Berkowitz and LePage found that:**
   (a) Aggressive cues in the situation make aggression inevitable.
   (b) There was no significant difference between their participant groups.
   (c) Frustration always makes us behave aggressively.
   (d) The presence of weapons stimulates aggression.

3. **We displace aggression onto innocent targets when:**
   (a) The true source of our frustration is weaker than us.
   (b) The true source of our frustration is unavailable.
   (c) We are particularly frustrated.
   (d) Our frustration is justified.

4. **According to negative affect theory:**
   (a) Frustration always produces aggression.
   (b) Negative feelings always lead to aggression.
   (c) Frustration can lead to negative feelings.
   (d) We all perceive frustrations in the same ways.

Social psychological explanations of aggression: Social learning theory

1. **An example of vicarious reinforcement is:**
   (a) Watching an adult being shouted at for kicking someone.
   (b) Watching an adult being praised for punching someone.
   (c) A child being told off for biting another child.
   (d) A child being allowed out of their room after apologising for hitting another child.

2. **Forming a mental image of how to perform an aggressive act is an example of:**
   (a) Retention.
   (b) Reinforcement.
   (c) Reproduction.
   (d) Attention.

3. **An example of self-efficacy:**
   (a) Expecting that using aggression in future interactions will be just as successful as in the past.
   (b) Lacking confidence in your ability to get what you want.
   (c) Believing that aggression never pays.
   (d) Having a good reason to be aggressive.

4. **The sentence 'A Bobo doll is designed to be hit' illustrates the problem of:**
   (a) Participant variables.
   (b) Cause and effect.
   (c) Demand characteristics.
   (d) Social desirability.

Social psychological explanations of aggression: De-individuation

1. **Which is the best example of de-individuated behaviour?**
   (a) Driving at 25 mph in a 30 mph zone.
   (b) Waiting patiently in the queue for lunch.
   (c) Using your real name on internet forums.
   (d) Throwing a brick through the window of a bank during a protest.

2. **Public self-awareness is:**
   (a) Increased when we are part of a crowd.
   (b) How much we care about what other people think of us.
   (c) Monitoring your own behaviours when with others.
   (d) Becoming less self-critical when part of a crowd.

3. **In the 'deviance in the dark' study, the participants:**
   (a) Became argumentative and aggressive with each other.
   (b) Behaved no differently from when the lights were on.
   (c) Sat in silence throughout the procedure.
   (d) Became quite intimate when the lights went out.

4. **The SIDE model predicts that:**
   (a) Anonymity always leads to aggressive behaviour.
   (b) People conform to group norms when they are anonymous.
   (c) Reduced self-awareness encourages anti-normative behaviour.
   (d) When people are anonymous, they focus more on their own thoughts and feelings.

Institutional aggression in the context of prisons

1. **According to the importation model:**
   (a) Prisons reflect criminal subcultures in the real world.
   (b) Prison aggression is caused mostly by situational factors.
   (c) Most prisoners are more likely to use aggression in prison than in the outside world.
   (d) Prisoners are aggressive because they have lost their freedom.

2. **Deprivation leads to aggression in prisons because:**
   (a) It creates competition amongst inmates for material goods.
   (b) Some prisoners are just more aggressive than others.
   (c) Many prisoners have a history of violent behaviour.
   (d) Dispositional factors are more important than situational ones.

3. **Camp and Gaes' conclusions are especially valid because:**
   (a) They found a significant positive correlation between prison category and aggression.
   (b) They selected a representative sample of prison inmates.
   (c) The inmates in their study were randomly allocated to prisons.
   (d) It was a laboratory experiment.

4. **The deprivation model is contradicted by research into:**
   (a) Conflict in prisons over drugs.
   (b) Conjugal visits.
   (c) Weak prison leadership.
   (d) Loss of material goods in prisons.

Media influences on aggression

1. **Robertson *et al.* investigated:**
   (a) Violent TV content.
   (b) Excessive TV viewing.
   (c) Violent computer game content.
   (d) Aggression in childhood.

2. **According to Paik and Comstock the role of media in children's aggression is:**
   (a) Very substantial.
   (b) Non-existent.
   (c) Relatively minor.
   (d) Truly terrifying.

3. **Which statement is true?**
   (a) All aggression is violence.
   (b) All aggression and violence are criminal.
   (c) All violence is aggression.
   (d) It doesn't matter how aggression is defined.

4. **According to Anderson *et al.*, social learning theory is:**
   (a) 'A valid but unreliable explanation'.
   (b) 'Nothing to do with media and aggression'.
   (c) 'A weak theory of media effects'.
   (d) 'A convincing theoretical framework'.

Desensitisation, disinhibition and cognitive priming

1. **One feature of desensitisation to violent media is:**
   (a) Storage of aggressive 'scripts' in memory.
   (b) We no longer respond to media aggression with arousal.
   (c) Realisation that aggression is an unacceptable form of conflict resolution.
   (d) Greater empathy for victims of aggression.

2. **Cognitive priming of aggressive behaviour occurs when:**
   (a) We perceive cues in a situation as aggressive when they are neutral.
   (b) We no longer respond to media aggression with arousal.
   (c) Social norms discourage the use of aggression.
   (d) We realise there are alternatives to aggression.

3. **'Loosening social constraints against aggressive behaviour' is an example of:**
   (a) Desensitisation.
   (b) Inhibition.
   (c) Disinhibition.
   (d) Cognitive priming.

4. **A problem with desensitisation is that it:**
   (a) Suggests that aggression is a safety valve.
   (b) Is based only on lab experiments.
   (c) Cannot explain media influence on reactive aggression.
   (d) Has no research support.



MCQ answers

Neural and hormonal mechanisms in aggression 1C, 2B, 3C, 4C
Genetic factors in aggression 1B, 2A, 3C, 4A
The ethological explanation of aggression 1C, 2D, 3C, 4B
Evolutionary explanations of human aggression 1C, 2A, 3D, 4D
Social psychological explanations of aggression: Frustration-aggression hypothesis 1B, 2D, 3B, 4C
Social psychological explanations of aggression: Social learning theory 1B, 2A, 3A, 4C
Social psychological explanations of aggression: De-individuation 1D, 2B, 3D, 4B
Institutional aggression in the context of prisons 1A, 2A, 3C, 4B
Media influences on aggression 1B, 2C, 3C, 4D
Desensitisation, disinhibition and cognitive priming 1B, 2A, 3C, 4C

Chapter 12 Forensic psychology

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In order to study forensic psychology, we first need to understand what crime is. So, to begin with, a light-hearted look at a serious subject …

Which of the following UK and US laws are genuine and which are made up?

1. It is illegal to die in the Houses of Parliament.
2. In Liverpool, it is illegal for a woman to be topless except as a clerk in a tropical fish store.
3. In the UK a pregnant woman can legally relieve herself anywhere she wants, including in a policeman's helmet.
4. The head of any dead whale found on the British coast automatically becomes the property of the King, and the tail belongs to the Queen.
5. In the city of York it is legal to murder a Scotsman within the ancient city walls, but only if he is carrying a bow and arrow.
6. In Ohio, it is illegal to get a fish drunk.
7. In Utah, it is illegal to walk down the street carrying a paper bag.
8. In Alabama, it is illegal to be blindfolded while driving a vehicle.
9. In Florida, unmarried women who parachute on a Sunday could be jailed.
10. In Vermont, women must obtain written permission from their husbands to wear false teeth.

(Answers on page 353)

Offender profiling: The top-down approach

The specification says...

Offender profiling: the top-down approach, including organised and disorganised types of offender.

One of the key contributions from forensic psychology to the science of crime is a means of identifying the person(s) who committed a crime. Offender profiling aims to achieve this, based on the idea that the characteristics of an offender can be deduced from the characteristics of the offence and the particulars of the crime scene.

We shall consider two approaches to profiling: the top-down approach (on this spread) and the bottom-up approach on the next spread.

Key terms

Offender profiling A behavioural and analytical tool that is intended to help investigators accurately predict and profile the characteristics of unknown offenders.

The top-down approach Profilers start with a pre-established typology and work down to lower levels in order to assign offenders to one of two categories based on witness accounts and evidence from the crime scene.

Organised offender An offender who shows evidence of planning, targets a specific victim and tends to be socially and sexually competent with higher-than-average intelligence.

Disorganised offender An offender who shows little evidence of planning, leaves clues and tends to be socially and sexually incompetent with lower-than-average intelligence.



The top-down approach originated with the FBI and involves careful collection of data from crime scenes.

The top-down approach

Offender profiling

Offender profiling is an investigative tool employed by the police when solving **crimes**, the main aim of which is to narrow the list of likely suspects. Professional profilers will often be called upon to work alongside the police especially during high-profile murder cases. Methods vary, but the compiling of a profile will usually involve careful scrutiny of the crime scene and analysis of the other evidence (including witness reports) in order to generate **hypotheses** about the probable characteristics of the offender (their age, background, occupation, etc.).

The American approach

The top-down approach to profiling originated in the United States as a result of work carried out by the FBI in the 1970s. More specifically, the FBI's Behavioural Science Unit drew upon data gathered from in-depth **interviews** with 36 sexually-motivated murderers including Ted Bundy (see below) and Charles Manson. They then concluded that the data could be categorised into organised or disorganised crimes/murders. Each category had certain characteristics (described below) which meant that if, in a future situation, the data from a crime scene matched some of the characteristics of one category, we could then predict other characteristics that would be likely. This could then be used to find the offender.

Offender profilers who use the top-down method will collect data about a murder (characteristics of the murderer, the crime scene, etc.) and then decide on the category the data best fits.

Organised and disorganised types of offender

The organised and disorganised distinction is based on the idea that serious offenders have certain signature 'ways of working' (often referred to as their *modus operandi*) and these generally **correlate** with a particular set of social and psychological characteristics that relate to the individual.

Organised offenders show evidence of having planned the crime in advance. The victim is deliberately targeted and this suggests that the killer or rapist has a 'type' of victim they seek out. The offender maintains a high degree of control during the crime and may operate with almost detached surgical precision. There is little evidence or clues left behind at the scene. They tend to be of above-average intelligence, in a skilled, professional occupation and are socially and sexually competent. They are usually married and may even have children.

In contrast, **disorganised offenders** show little evidence of planning, suggesting that their offences may be spontaneous, spur-of-the-moment acts. The crime scene tends to reflect the impulsive nature of the attack – the body is usually still at the scene and there appears to have been very little control on the part of the offender. They tend to have a lower-than-average IQ, be in unskilled work or unemployed, and often have a history of sexual dysfunction and failed relationships. They tend to live alone and often relatively close to where the offence took place.

Constructing an FBI profile

There are four main stages in the construction of an FBI profile:

1. Data assimilation – the profiler reviews the evidence (crime scene photographs, pathology reports, witness reports, etc.).
2. Crime scene classification – as either organised or disorganised.
3. Crime reconstruction – hypotheses in terms of sequence of events, behaviour of the victim, etc.
4. Profile generation – hypotheses related to the likely offender, e.g. of demographic background, physical characteristics, behaviour, etc.

Apply it
Concepts

Ted Bundy – the classic 'organised' killer?

Theodore Robert 'Ted' Bundy is one of the United States' most notorious serial killers. During the 1970s, Bundy is known to have raped, tortured and brutally murdered over 30 women (though the actual figure may be much higher) across seven US states.

Handsome, charming and highly intelligent – traits he used to win the trust of his victims – Bundy attended the University of Washington and later, law school, where he excelled. While a student, Bundy had a serious relationship with a young woman who ultimately broke up with him. A psychiatrist later pinpointed this as a pivotal moment in his descent into becoming a murderer. It is said that many of Bundy's later victims resembled this girlfriend. His killings usually followed a gruesome pattern. He often raped his victims before beating them to death.

After escaping police custody twice, Bundy was executed by electric chair in 1989.

Question

To what extent does Bundy fit the profile of the organised offender?

Evaluation

Research support

One strength of the top-down approach is that there is support for a distinct organised category of offender.

In order to test the organised–disorganised typology which is central to the top-down approach, David Canter *et al.* (2004) conducted an analysis of 100 US murders each committed by a different serial killer. A technique called *smallest space analysis* was used – a statistical technique that identifies correlations across different samples of behaviour. In this case the analysis was used in order to assess the co-occurrence of 39 aspects of serial killings. This included such things as whether there was torture or restraint, whether there was an attempt to conceal the body, the form of murder weapon used and the cause of death. This analysis revealed that there does seem to be a subset of features of many serial killings which matched the FBI's typology for organised offenders.

This suggests that a key component of the FBI typology approach has some **validity**.

Counterpoint However, many studies suggest that the organised and disorganised types are not mutually exclusive. There are a variety of combinations that occur at any given murder scene. For instance, Maurice Godwin (2002) argues that, in reality, it is difficult to classify killers as one or the other type. A killer may have multiple contrasting characteristics, such as high intelligence and sexual competence, but commits a spontaneous murder leaving the victim's body at the crime scene.

This suggests that the organised–disorganised typology is probably more of a continuum.

Wider application

Another strength of top-down profiling is that it can be adapted to other kinds of crime, such as burglary.

Critics of top-down profiling have claimed that the technique only applies to a limited number of crimes, such as sexually-motivated murder. However, Tina Meketa (2017) reports that top-down profiling has recently been applied to burglary, leading to an 85% rise in solved cases in three US states. The detection method retains the organised–disorganised distinction but also adds two new categories: *interpersonal* (offender usually knows their victim and steals something of significance) and *opportunistic* (generally inexperienced young offender).

This suggests that top-down profiling has wider application than was originally assumed.

Flawed evidence

One limitation of top-down profiling is the evidence on which it is based.

As we have seen, FBI profiling was developed using interviews with 36 murderers in the US – 25 of which were serial killers, the other 11 being single or double murderers. At the end of the process, 24 of these individuals were classified as organised offenders and 12 were disorganised. Canter *et al.* (above) have argued that the sample was poor – the FBI agents did not select a random or even a large sample nor did the sample include different kinds of offender. There was no standard set of questions so each interview was different and therefore not really comparable.

This suggests that top-down profiling does not have a sound, scientific basis.

Evaluation eXtra

Personality

The top-down approach is based on the principle of behavioural consistency – that serial offenders have characteristic ways of working (their *modus operandi*). These should be seen across all their crime scenes. It should therefore be possible for profilers to link different crime scenes together making the offender easier to catch.

In contrast, situationist psychologists, for instance Walter Mischel (1968), argue that people's behaviour is much more driven by the situation they are in than by a thing called 'personality'. Behavioural patterns seen at a crime scene may tell us little about how that individual behaves in everyday life.

Consider: *What are the implications of this for the top-down approach?*

Apply it Concepts — Organised or disorganised?

Case One

A teenage victim was attacked in the morning on a secluded path that is very rarely used. She was seized from behind, dragged into some bushes, gagged and bound with duct tape, and sexually assaulted. The path cannot be seen from nearby roads, and can only be accessed from an estate on one side. The victim had unexpectedly spent the night at a friend's house and had not used the path before.

Case Two

Between 1986 and 1988, seven attacks on elderly women took place in tower blocks in Birmingham. Women in their 70s and 80s, often infirm, were followed into the lifts by a stocky young man who took them to the top floor of the tower block. He would rape the women and then flee. Consistent patterns seemed to suggest the same man was responsible. In his interactions with the women he appeared confident and at ease. He made no attempt to disguise himself and forensic evidence was found on each occasion. Police eventually arrested Adrian Babb, an attendant at the local swimming pool, to which all of Babb's victims were regular visitors.

Questions

1. Would you classify Case One as organised or disorganised? Explain your answer.
2. Would you classify Case Two as organised or disorganised? Explain your answer.
3. How do both of these cases illustrate some of the problems with the top-down approach to offender profiling?



Apply it Methods — Analysis of police records

A team of researchers analysed historical police records of 100 solved murder cases and found no significant correlation between details of the crime scene and the characteristics of the offender.

Questions

1. Outline what is meant by **secondary data**. Refer to the investigation above in your answer. (*2 marks*)
2. Evaluate the use of secondary data in this psychological research. (*4 marks*)
3. Identify the **co-variables** in this correlation. (*2 marks*)
4. Evaluate the use of correlational analysis in this psychological research. (*6 marks*)

Check it

1. Define what is meant by 'offender profiling'. *[2 marks]*
2. Outline the top-down approach to offender profiling. *[3 marks]*
3. Explain the difference between organised and disorganised types of offender. *[4 marks]*
4. Discuss the top-down approach to offender profiling. *[16 marks]*

Offender profiling: The bottom-up approach

The specification says...

Offender profiling: the bottom-up approach, including investigative psychology; geographical profiling.

The bottom-up approach to offender profiling, unlike its American counterpart, was largely developed in Britain and is most closely associated with the work of David Canter. Canter's work has contributed much to the field of offender profiling in moving it into a more scientific and empirical domain. Here, we consider two examples of the bottom-up approach: investigative psychology and geographical profiling.

Key terms

The bottom-up approach Profilers work up from evidence collected from the crime scene to develop hypotheses about the likely characteristics, motivations and social background of the offender.

Investigative psychology A form of bottom-up profiling that matches details from the crime scene with statistical analysis of typical offender behaviour patterns based on psychological theory.

Geographical profiling A form of bottom-up profiling based on the principle of spatial consistency – that an offender's operational base and possible future offences are revealed by the geographical location of their previous crimes.

Apply it Concepts The Railway Rapist

David Canter came to prominence after he assisted police in the capture of John Duffy (the 'Railway Rapist') in the 1980s. John Duffy carried out 24 sexual attacks on women and three murders near railway stations in North London. Canter analysed geographical information from the crime scenes and combined this with details of similar attacks in the past supplied by police. In doing so, Canter was able to draw up a profile of Duffy (below) which was surprisingly accurate and led to his eventual arrest and conviction.

Question

How does this case support both versions of the bottom-up approach described on this page?

Canter's profile	True facts about Duffy
Lives in Kilburn	Lived in Kilburn
Marriage problems	Separated
Physically small, unattractive	5ft 4in with acne
Martial artist	Member of martial arts club
Need to dominate women	Violent – attacked wife
Fantasies of rape, bondage	Tied up his wife before sex

The bottom-up approach

The aim of the **bottom-up approach** is to generate a picture of the offender – their likely characteristics, routine behaviour and social background – through systematic analysis of evidence at the crime scene. Unlike the US **top-down approach**, an investigation that is using the British bottom-up model does not begin with fixed typologies. Instead, the profile is 'data-driven' and emerges as the investigator engages in deeper and more rigorous scrutiny of the details of the offence. Bottom-up profiling is also much more grounded in psychological theory than the top-down approach, as we shall see.

Investigative psychology

The discipline of **investigative psychology** is an attempt to apply statistical procedures, alongside psychological theory, to the analysis of crime scene evidence. The aim, in relation to offender profiling, is to establish patterns of behaviour that are likely to occur – or coexist – across crime scenes. This is in order to develop a statistical database which then acts as a baseline for comparison. Specific details of an offence, or related offences, can then be matched against this database to reveal important details about the offender, their personal history, family background, etc. This may also determine whether a series of offences are linked in that they are likely to have been committed by the same person.

Central to the approach is the concept of *interpersonal coherence* – that the way an offender behaves at the scene, including how they 'interact' with the victim, may reflect their behaviour in more everyday situations. For instance, whilst some rapists want to maintain maximum control and humiliate their victims, others are more apologetic (Dwyer 2001). This might tell police something about how the offender relates to women more generally.

The *significance of time and place* is also a key variable and, as in geographical profiling below, may indicate where the offender is living.

Finally, *forensic awareness* describes those individuals who have been the subject of police interrogation before, their behaviour may denote how mindful they are of 'covering their tracks'.

Geographical profiling

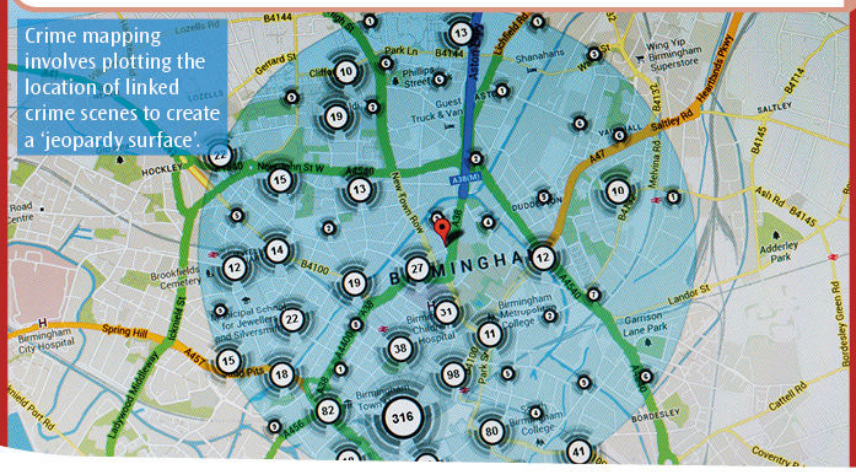
Geographical profiling uses information about the location of linked crime scenes to make inferences about the likely home or operational base of an offender – known as *crime mapping* and based on the principle of *spatial consistency* (that people commit crimes within a limited geographical space). It can be used in conjunction with psychological theory (such as that informed by investigative psychology above) to create hypotheses about how the offender is thinking as well as their *modus operandi*.

The assumption is that serial offenders will restrict their 'work' to geographical areas they are familiar with, and so understanding the spatial pattern of their behaviour provides investigators with a 'centre of gravity' which is likely to include the offender's base (often in the middle of the spatial pattern).

This is the basis of Canter's *circle theory* (Canter and Larkin 1993) because the pattern of offending forms a circle around the offender's home base. In addition the distribution of offences leads us to describe an offender in one of two ways:

- The marauder – who operates in close proximity to their home base.
- The commuter – who is likely to have travelled a distance away from their usual residence.

Such spatial decision-making can offer the investigative team important insight into the nature of the offence, i.e. whether it was planned or opportunistic, as well as revealing other important factors about the offender, such as their 'mental maps', mode of transport, employment status, approximate age, etc.



Crime mapping involves plotting the location of linked crime scenes to create a 'jeopardy surface'.

Evaluation

Evidence for investigative psychology

One strength of investigative psychology is that evidence supports its use.

David Canter and Rupert Heritage (1990) conducted an analysis of 66 sexual assault cases. The data was examined using *smallest space analysis* (see previous spread). Several behaviours were identified as common in different samples of behaviour, such as the use of impersonal language and lack of reaction to the victim. Each individual displayed a characteristic pattern of such behaviours and this can help establish whether two or more offences were committed by the same person (referred to as 'case linkage').

This supports one of the basic principles of investigative psychology (and the bottom-up approach) that people are consistent in their behaviour.

Counterpoint However, case linkage depends on the database and this will only consist of historical crimes that have been solved. The fact that they were solved may be because it was relatively straightforward to link these crimes together in the first place. Which makes this a circular argument.

This suggests that investigative psychology may tell us little about crimes that have few links between them and therefore remain unsolved.

Evidence for geographical profiling

Another strength is evidence to support geographical profiling.

Samantha Lundrigan and David Canter (2001) collated information from 120 murder cases involving serial killers in the US. Smallest space analysis revealed spatial consistency in the behaviour of the killers. The location of each body disposal site created a 'centre of gravity' presumably because, when offenders start from their home base they may go in a different direction each time they dispose of a body, but in the end all these different sites create a circular effect around the home base. The offender's base was invariably located in the centre of the pattern. The effect was more noticeable for offenders who travelled short distances (marauders).

This supports the view that geographical information can be used to identify an offender.

Geographical information insufficient

One limitation is that geographical profiling may not be sufficient on its own.

As with investigative psychology, the success of geographical profiling may be reliant on the quality of data that the police can provide. Unfortunately, recording of crime is not always accurate, can vary between police forces and an estimated 75% of crimes are not even reported to police in the first place (criminologists often refer to this as the 'dark figure of crime'). This calls into question the utility of an approach that relies on the accuracy of geographical data. Even if this information is correct, critics claim that other factors are just as important in creating a profile, such as the timing of the offence and the age and experience of the offender (Ainsworth 2001).

This suggests that geographical information alone may not always lead to the successful capture of an offender.

Evaluation eXtra

Mixed results

Offender profiling has something of a mixed history and is regarded in different ways by police forces. For example, Gary Copson (1995) surveyed 48 police departments and found that the advice provided by the profiler was judged to be 'useful' in 83% of cases, which suggests it is a valid investigative tool.

However, the same study revealed that in only 3% of cases did it lead to the accurate identification of the offender! The Rachel Nickell case (above right) offers a stark reminder of how profiling can be misused. Finally, Richard Kocsis *et al.* (2002) found that chemistry students produced more accurate offender profiles on a solved murder case than experienced senior detectives.

Consider: *On balance, are offender profiling approaches (bottom-up or top-down) worthwhile?*



Metropolitan Police were heavily criticised as a result of the Rachel Nickell enquiry.

Apply it Concepts

The case of Rachel Nickell

In 1992, 21-year-old Rachel Nickell was stabbed 47 times and sexually assaulted in a frenzied attack on Wimbledon Common. Her two-year-old son was the only witness. Police launched a massive manhunt and enlisted offender profiler Paul Britton to help with the enquiry. The investigation quickly targeted Colin Stagg, a local man who often walked his dog on the common and fitted the offender profile Britton had drawn up. Under Britton's direction the Metropolitan Police instigated a 'honey trap'. Over the course of five months, an undercover policewoman pursued Stagg feigning a romantic interest in him and tried to get him to confess to Rachel's murder. When the case eventually came to court, the judge threw it out – the only link between Stagg and Rachel's death was Britton's profile and the expensive undercover police operation.

In 2008, following examination of new forensic evidence, Robert Napper was convicted of Rachel's murder. It turned out that Napper had been ruled out of the Rachel Nickell enquiry at an early stage because he was several inches taller than the profile.

Question

How does this case illustrate some of the problems with offender profiling?

Apply it Methods

Comparing profiles

Ten professional profilers in the UK (using the bottom-up approach) and ten professional profilers in the US (using the top-down approach) were given details of a solved murder case that they had never seen before. All were asked to write a profile of the killer based on the information they were presented with. The accuracy of the profiles was rated by two independent judges and the difference in accuracy between the UK and US profiles was analysed.

Questions

1. What type of **experimental design** was used in the investigation above? Justify your answer. (*2 marks*)
2. Explain *one* limitation of this experimental design in the investigation above. (*3 marks*)
3. Explain *one* way in which the independent judges could have assessed the **reliability** of their ratings. (*3 marks*)
4. Which **statistical test** should be used to analyse the difference in the accuracy of the profiles? Give *two* reasons for your answer. (*3 marks*)

Check it

1. In the context of offender profiling, explain what is meant by the 'bottom-up approach'. *[3 marks]*
2. Explain what research has shown about investigative psychology. *[6 marks]*
3. Explain what research has shown about geographical profiling. *[6 marks]*
4. Discuss investigative psychology **and/or** geographical profiling. *[16 marks]*

Biological explanations: An historical approach

The specification says...

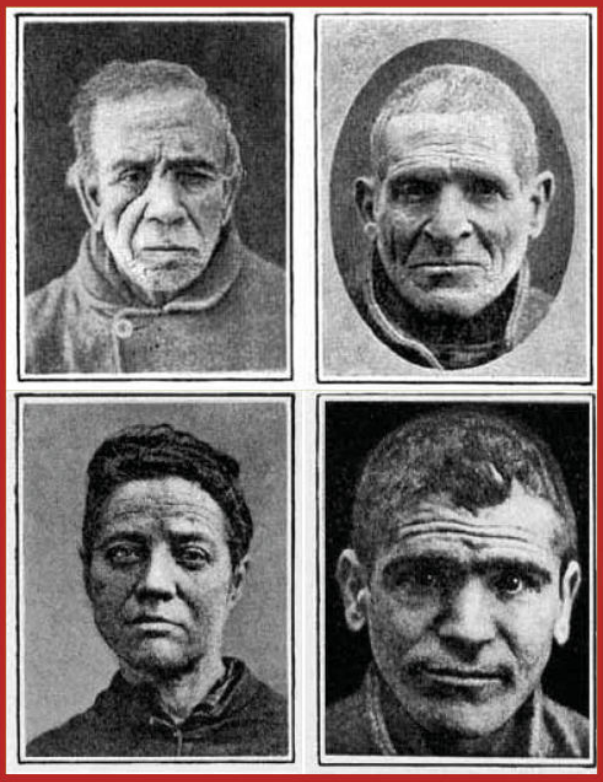
Biological explanations of offending behaviour: an historical approach (atavistic form).

The question of whether criminals are born or made is a question of nature versus nurture. In fact biological explanations can be both – criminal behaviour may be inherited but it may also be due to acquired abnormalities in brain structure.

An early biological explanation of offending was advanced by Cesare Lombroso – the atavistic form. By today's standards, many of Lombroso's methods and conclusions would be regarded as laughable. However, as we shall see, he was one of the first researchers to establish a more scientific basis for the study of crime.

Key term

Atavistic form A biological approach to offending that attributes criminal activity to the fact that offenders are genetic throwbacks or a primitive subspecies ill-suited to conforming to the rules of modern society. Such individuals are distinguishable by particular facial and cranial characteristics.



Images of criminals from Lombroso's research who he classified as possessing atavistic characteristics.

Study tip

Remember, Lombroso's theory has a genetic basis and so can be discussed as part of an essay on 'biological explanations of offending', unless of course, 'early biological explanations' are specifically ruled out in the question.

Atavistic form

Historical approach

In 1876, Cesare Lombroso, an Italian physician, wrote a book *called L'Uomo Delinquente* (roughly translated as 'the criminal man') in which he suggested that criminals were '**genetic** throwbacks' – a primitive subspecies who were biologically different from non-criminals. By today's standards, Lombroso's theory of the **atavistic form** would be best described as speculative and naïve.

A biological approach

Offenders were seen by Lombroso as lacking evolutionary development, their savage and untamed nature meant that they would find it impossible to adjust to the demands of civilised society and would inevitably turn to **crime**. As such, Lombroso saw offending behaviour as a natural tendency, rooted in the **genes** of those who engage in it. At the time he was writing, Lombroso was proposing a new perspective – that offending behaviour was innate and therefore an offender was not to blame for his actions. In this way, his ideas were revolutionary.

Atavistic form

What's more, Lombroso argued, the offender subtype could be identified as being in possession of particular physiological 'markers' that were linked to particular types of offence. These are biologically determined 'atavistic' characteristics, mainly features of the face and head (though atavism can include other features), that make offenders physically different from the rest of us.

In terms of cranial (skull) characteristics, the atavistic form included a narrow, sloping brow, a strong prominent jaw, high cheekbones and facial asymmetry. Other physical markers included dark skin and the existence of extra toes, nipples or fingers.

Besides physical traits, Lombroso suggested there were other aspects of the born offender including insensitivity to pain, use of slang, tattoos and unemployment.

Offender types

Lombroso went on to categorise particular types of offender in terms of their physical and facial characteristics. Murderers were described as having bloodshot eyes, curly hair and long ears, whereas sexual deviants had glinting eyes, swollen, fleshy lips and projecting ears, and the lips of fraudsters were thin and 'reedy'.

Lombroso's research

Lombroso meticulously examined the facial and cranial features of hundreds of Italian convicts, both living and dead, and concluded that there was an 'atavistic form'. Furthermore he concluded that these features were key indicators of criminality. In all, Lombroso examined the skulls of 383 dead convicts and 3839 living ones, and concluded that 40% of criminal acts are committed by people with atavistic characteristics.

Apply it
Concepts

Serial killers and the atavistic form

Lombroso's theory suggests it should be possible to identify offenders from their unusual facial and physical features. Below is a list of six high profile serial killers (who were convicted in the UK or US) within recent decades:

- Fred West
- Peter Sutcliffe
- Ian Brady
- Myra Hindley
- Jeffrey Dahmer
- John Wayne Gacy

Questions

1. Find some images of these individuals on the internet. Do they have any of the facial or physical features that Lombroso was talking about?
2. Does this support or challenge Lombroso's explanation?

Practical activity on page 347

Evaluation

Lombroso's legacy

One strength of Lombroso's work is it changed the face of the study of crime.

Lombroso has been hailed as the 'father of modern criminology' – he himself coined the term 'criminology' (Hollin 1989). He is also credited as shifting the emphasis in crime research away from a moralistic discourse (in which offenders were judged as being wicked and weak-minded) towards a more scientific position (that of evolutionary influences and genetics where individuals are not to blame). Also, in trying to describe how particular types of people are likely to commit particular types of crime, Lombroso's theory in many ways heralded the beginning of offender profiling.

This suggests that Lombroso made a major contribution to the science of criminology.

Counterpoint However, several critics, including Matt DeLisi (2012), have questioned whether Lombroso's legacy is entirely positive. Attention has been drawn to the racist undertones within Lombroso's work. Many of the features that Lombroso identified as atavistic (curly hair, dark skin) are most likely to be found among people of African descent. In other words he was basically suggesting that Africans were more likely to be offenders, a view that fitted 19th-century **eugenic** attitudes.

This suggests that some aspects of his theory were highly subjective rather than objective, influenced by racial prejudices of the time.

Contradictory evidence

One limitation is evidence contradicts the link between atavism and crime.

Charles Goring (1913), like Lombroso, set out to establish whether there was anything physically atypical about offenders. After conducting a comparison between 3000 offenders and 3000 non-offenders he concluded that there was no evidence that offenders are a distinct group with unusual facial and cranial characteristics (though he did suggest that many people who commit crime have lower-than-average intelligence).

This challenges the idea that offenders can be physically distinguished from the rest of the population and are therefore unlikely to be a subspecies.

Poor control

Another limitation is that Lombroso's methods of investigation were poorly controlled.

Lombroso failed to control important variables within his research. Unlike Goring, he did not compare his offender sample with a non-offender **control group**. This could have controlled for an assortment of **confounding variables** that might have equally explained higher crime rates in certain groups of people. For instance, research has demonstrated links between crime and social conditions such as poverty and poor educational outcomes (Hay and Forrest 2009) – links that would explain why offenders were more likely, for example, to be unemployed.

This suggests that Lombroso's research does not meet modern scientific standards.

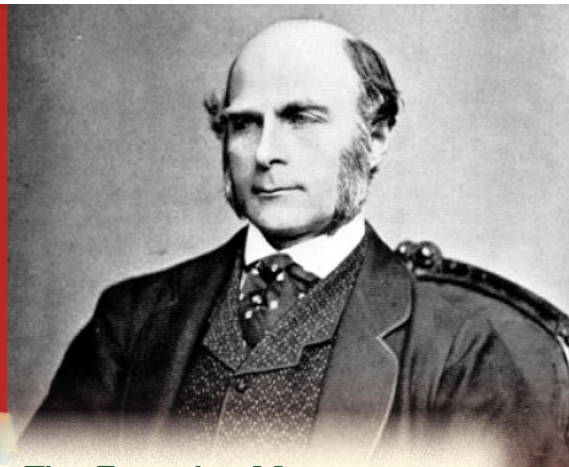
Evaluation eXtra

Nature or nurture?

Lombroso's work raises the question of whether criminals are born or made. The atavistic form suggests that crime has a biological cause, it is genetically determined.

However, even if there are criminals who have some of the atavistic features that Lombroso suggested, this does not mean this is the cause of their offending. Facial and cranial differences may be influenced by other factors, such as poverty or poor diet, rather than inherited.

Consider: *Is the atavistic form due to nature or nurture?*



Francis Galton, author of the book *Hereditary Genius* which established the Eugenics Movement, often described as 'scientific racism'.

Apply it Concepts — The Eugenics Movement

The work of Francis Galton in the 1880s is generally cited as the beginning of the Eugenics Movement. Galton was heavily influenced by his first cousin, Charles Darwin, whose concept of 'survival of the fittest' became the cornerstone of eugenics philosophy.

Galton's basic argument was that people are not born equal. Desirable human traits, such as intelligence, morality and civility, are inherited and found in some social and cultural groups (the genetically 'fit') more than others (the genetically 'unfit'). Those groups with a genetic advantage should be allowed to breed for the good of society, whilst those without genetic advantages should be prevented from breeding.

Question

Explain how Lombroso's theory might be seen as supporting the eugenics philosophy and its practices.

Apply it Methods — Lombroso's study

As we have seen, the methodology Lombroso used to find support for his atavistic form theory has been heavily criticised. In part this can be excused as, at the time Lombroso was writing, the scientific study of criminology was in its infancy and research methods generally were less rigorous.

Questions

If you were to reinvestigate Lombroso's hypothesis – that criminals are physiologically different from non-criminals – what changes would you make to Lombroso's study in order to improve it?

In particular you should consider the following:

1. The **sample** you will include and how the sample will be selected. (*2 marks*)
2. A suitable comparison/**control group**. (*1 mark*)
3. The **experimental design**. (*1 mark*)
4. The **IV** and **DV** and the **hypothesis**. (*3 marks*)
5. **Confounding variables** and how they might be controlled. (*2 marks*)
6. How you will analyse the data (**descriptive** *and* **inferential statistics**). (*4 marks*)

Check it

1. Outline how the atavistic form can explain offending behaviour. *[3 marks]*
2. Briefly explain **two** contributions that atavistic form has made to our modern understanding of crime. *[4 marks]*
3. Evaluate the atavistic form as an explanation for offending. *[6 marks]*
4. Discuss **one** historical approach to offending behaviour. *[16 marks]*

Biological explanations: Genetic and neural

The specification says...

Biological explanations of offending behaviour: genetics and neural explanations.

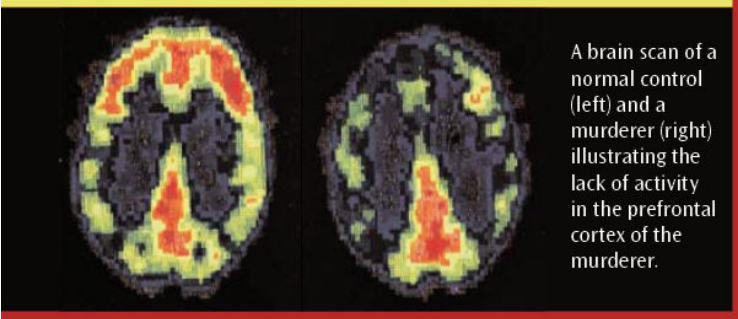
Though Lombroso's explanation of offending has been largely discredited, his suggestion that criminality may be an inherited characteristic (i.e. genetic) continues to be investigated.

The genetic and neural explanations for criminality are not unconnected. It may be that some underlying genetic abnormality is causing structural and functional differences in the 'criminal brain'. However neural abnormalities may also be caused by non-genetic factors.

Key terms

Genetics Genes consist of DNA strands. DNA produces 'instructions' for general physical features of an organism (such as eye colour, height) and also specific physical features (such as neurotransmitter levels and size of brain structures). These may impact on psychological features (such as intelligence and mental disorder). Genes are transmitted from parents to offspring, i.e. inherited.

Neural explanation Any explanation of behaviour (and its disorders) in terms of (dys)functions of the brain and nervous system. This includes the activity of brain structures such as the prefrontal cortex, and neurotransmitters such as serotonin and dopamine.



A brain scan of a normal control (left) and a murderer (right) illustrating the lack of activity in the prefrontal cortex of the murderer.

Apply it Methods

Comparing brain volume

Researchers conducted a study in which they compared the total brain volume of violent offenders with non-offenders using an MRI scan. An unrelated *t*-test revealed that there was a difference in total brain volume between the two groups and that this difference was significant at the 0.05 level.

Questions

1. Write a suitable **non-directional hypothesis** for the investigation. (*2 marks*)
2. Explain what is meant by **interval data**. Refer to the investigation in your answer. (*3 marks*)
3. Apart from the use of interval data, explain *two* reasons why researchers chose to analyse the data using an **unrelated *t*-test**. (*4 marks*)
4. Explain what is meant by the phrase '**significant** at the 0.05 level'. (*2 marks*)
5. Distinguish between a **Type I** and a **Type II error** in psychological research. Refer to this investigation in your answer. (*4 marks*)

Genetic explanations

Genetic explanations for **crime** suggest that would-be offenders inherit a gene, or combination of genes, that predispose them to commit crime.

Twin and adoption studies

The importance of genes is illustrated by **twin studies**. For example, Karl Christiansen (1977) studied over 3500 twin pairs in Denmark, and found **concordance** rates for offender behaviour of 35% for identical twin (**MZ**) males and 13% for non-identical twin (**DZ**) males (with slightly lower rates for females). This included all twins born between 1880 and 1910 in a region of Denmark. Offender behaviour was checked against Danish police records. This data indicates that it is not just the behaviour that might be inherited but the underlying predisposing traits.

Raymond Crowe (1972) found that adopted children whose biological mother had a criminal record had a 50% risk of having a criminal record by the age of 18, whereas adopted children whose biological mother didn't have a criminal record only had a 5% risk.

Candidate genes

A genetic analysis of almost 800 Finnish offenders by Jari Tiihonen *et al.* (2015) suggested that two genes (MAOA and CDH13) may be associated with violent crime. The **MAOA** gene regulates serotonin in the brain and has been linked to aggressive behaviour (see page 294) and the CDH13 gene has been linked to substance abuse and **attention deficit hyperactivity disorder**). The analysis found that about 5–10% of all severe violent crime in Finland is attributable to the MAOA and CDH13 genotypes.

Diathesis-stress model

If genetics do have some influence on offending, it seems likely that this is at least partly moderated by the effects of the environment. Elsewhere, we have seen how the **diathesis-stress model** has been applied to **schizophrenia** (see page 214). A tendency towards offending behaviour may come about through the combination of genetic predisposition and biological or psychological trigger – for example, being raised in a dysfunctional environment or having criminal role models.

Neural explanations

Evidence suggests there may be **neural** differences in the brains of offenders and non-offenders. Much of the evidence in this area has involved individuals diagnosed with **antisocial personality disorder** (formerly referred to as *psychopathy*). **APD** is associated with reduced emotional responses, a lack of empathy for the feelings of others, and is a condition that characterises many convicted offenders.

Prefrontal cortex

Adrian Raine has conducted many studies of the APD brain, reporting that there are several dozen brain-imaging studies demonstrating that individuals with antisocial personalities have reduced activity in the **prefrontal cortex**, the part of the brain that regulates emotional behaviour. Alongside this, Raine and his colleagues (2000) found an 11% reduction in the volume of grey matter in the prefrontal cortex of people with APD compared to controls.

Mirror neurons

Recent research suggests that offenders with APD *can* experience empathy but they do so more sporadically than the rest of us. Christian Keysers (2011) found that only when offenders were *asked* to empathise (with a person depicted on film experiencing pain) did their empathy reaction (controlled by **mirror neurons** in the brain) activate. This suggests that APD individuals are not totally without empathy, but may have a neural 'switch' that can be turned on and off, unlike the 'normal' brain which has the empathy switch permanently on. (Mirror neurons are also discussed on page 190.)

Evaluation

Issues with twin evidence

One limitation with using twin studies as genetic evidence is the assumption of equal environments.

It is assumed by researchers studying twins that environmental factors are held constant because twins are brought up together and therefore must experience similar environments. However, this 'shared environment assumption' may apply much more to MZ twins than DZ twins because MZ twins look identical and people (especially parents) tend to treat them more similarly which, in turn, affects their behaviour.

Therefore higher concordance rates for MZs in twin studies may simply be because they are treated much more similarly than DZ twins.

Support for diathesis-stress

One strength is support for the diathesis-stress model of offending.

A study of 13,000 Danish adoptees was conducted by Sarnoff Mednick *et al.* (1984). When neither the biological nor adoptive parents had convictions, the percentage of adoptees that did was 13.5% (which is quite high). This figure rose to 20% when either of the biological parents had convictions, and 24.5% when both adoptive and biological parents had convictions.

This shows that genetic inheritance plays an important role in offending but environmental influence is clearly also important, providing support for the diathesis-stress model of crime.

Evaluation eXtra

Nature and nurture

It is presumed that adoption studies, such as Mednick *et al.* above, are a good way of separating nature and nurture. If crime has a genetic component, then an adopted child should still experience the influence of the biological parent despite not living with them.

However, many adoptions take place when children are older, so they spend several years with their biological parents. In addition, many adoptees are encouraged to maintain contact with the biological family so biological parents exert an environmental influence.

Consider: *Do adoption studies separate nature and nurture?*

Evaluation

Brain evidence

One strength of the neural explanation is support for the link between crime and the frontal lobe.

Elizabeth Kandel and David Freed (1989) reviewed evidence of frontal lobe damage (including the prefrontal cortex) and antisocial behaviour. People with such damage tended to show impulsive behaviour, emotional instability and an inability to learn from their mistakes. The frontal lobe is associated with planning behaviour.

This supports the idea that brain damage may be a causal factor in offending behaviour.

Intervening variables

One limitation is the link between neural differences and APD may be complex.

Other factors may contribute to APD, and ultimately to offending. David Farrington *et al.* (2006, see page 334) studied a group of men who scored high on psychopathy (APD). These individuals had experienced various risk factors during childhood, such as being raised by a convicted parent and being physically neglected. It could be that these early childhood experiences caused APD and also some of the neural differences associated with it – such as reduced activity in the frontal lobe due to trauma (Rauch *et al.* 2006).

This suggests that the relationship between neural differences, APD and offending is complex and there may be other intervening variables that have an impact.

Evaluation eXtra

Biological determinism

The biological approach suggests that offending behaviour is determined by genetic/neural factors which cannot be controlled by the person. So a person should not be held responsible for a crime.

However, our justice system is based on the notion that we all have responsibility for our actions. Only in extreme circumstances (e.g. mental disorder), is an individual judged to lack responsibility. The identification of possible biological precursors to crime complicates this principle.

Consider: *Can someone with genetic or neural abnormalities be held responsible for their crimes?*



Double trouble . . . but why might the findings from twin studies related to crime be difficult to interpret?

Apply it
Concepts

The Mobley defence

In America in 1991, 25-year-old Stephen 'Tony' Mobley walked into *Domino's Pizza* and fatally shot the manager. In 1994, Mobley was found guilty of murder (as well as five other offences including assault and armed robbery) and was sentenced to death.

Mobley's legal team found that four generations of his family had been responsible for a range of violent and criminal acts – including rape and murder. The attorneys appealed his sentence on the basis that he had inherited a 'criminal gene' and could not be held responsible for his actions. The appeal was thrown out by the judge, and Mobley was executed by lethal injection in 2005.

However, in Italy in 2007, Abdelmalek Bayout received a 9-year sentence after he admitted to stabbing and killing a man but had his sentence cut by a year after the judge learned that Bayout had the aggression-prone variant of the MAOA gene.

Question

Leaving aside the question of whether this genetic link is well enough understood to justify the judge's decision, should genes ever be considered a legitimate legal defence?

Check it

1. Outline the neural explanation of offending behaviour. *[3 marks]*
2. Outline the genetic explanation of offending behaviour. *[3 marks]*
3. Explain what research (theories and/or studies) has shown about biological explanations of offending behaviour. *[6 marks]*
4. Discuss genetic **and/or** neural explanations of offending behaviour. *[16 marks]*

Psychological explanations: Eysenck's theory

The specification says...

Psychological explanations of offending behaviour: Eysenck's theory of the criminal personality.

Psychological explanations of offending shift the focus away from biological causes of crime towards psychological explanations such as cognitive, social, behaviourist and psychodynamic ones which we explore over the next three spreads.

Hans Eysenck's theory is something of a 'halfway house' in this respect. Even though his theory of the criminal personality would be properly classed as psychological, he does argue that all personality types have a biological basis.

Key term

The criminal personality A feature of Eysenck's theory of crime, an individual who scores highly on measures of extraversion, neuroticism and psychoticism and cannot easily be conditioned, is cold and unfeeling, and is likely to engage in offending behaviour.



According to Eysenck, offenders are natural extraverts: risk-takers, thrill-seekers, the life and soul of the party (but if you invite them, you might want to keep an eye on your valuables...).

Study tip

Make sure you're aware that Eysenck's theory can serve a dual purpose. As it appears under the heading of psychological explanations in the specification, it can obviously be used as part of a discussion of these. However, because Eysenck made links between personality type, genetic influences and the nervous system, there is a clear biological element here, too. As long as you make this clear, the theory might also be used as a biological explanation if made relevant.

Theory of the criminal personality

Personality theory

Hans Eysenck was an important figure in **personality** and intelligence research during the middle of the 20th century. Most notably Eysenck (1947) proposed that behaviour could be represented along two dimensions: **introversion–extraversion** (E) and **neuroticism–stability** (N). The two dimensions combine to form a variety of personality characteristics or traits. Eysenck later added a third dimension – **psychoticism–sociability** (P).

Biological basis

According to Eysenck, our personality traits are biological in origin and come about through the type of nervous system we inherit. Thus, all personality types – including the criminal personality type – have an innate, biological basis.

- **Extraverts** have an underactive nervous system which means they constantly seek excitement, stimulation and are likely to engage in risk-taking behaviours. They also tend not to condition easily and therefore do not learn from their mistakes.
- **Neurotic** individuals have a high level of reactivity in the **sympathetic nervous system** – they respond quickly to situations of threat (fight or flight). This means they tend to be nervous, jumpy and overanxious, and their general instability means their behaviour is often difficult to predict.
- **Psychotic** individuals are suggested to have higher levels of **testosterone** and are unemotional and prone to aggression.

The criminal personality

The criminal personality type is neurotic–extravert–psychotic. Neurotics are unstable and therefore prone to overreact to situations of threat. Extraverts seek more arousal and thus engage in dangerous activities. Psychotics are aggressive and lack empathy.

The role of socialisation

In Eysenck's theory, personality is linked to offending behaviour via socialisation processes. Eysenck saw offending behaviour as developmentally immature in that it is selfish and concerned with immediate gratification – offenders are impatient and cannot wait for things. The process of socialisation is one in which children are taught to become more able to delay gratification and more socially oriented. Eysenck believed that people with high E and N scores had nervous systems that made them difficult to condition. As a result, they are less likely to learn anxiety responses to antisocial impulses and, consequently, they would be more likely to act antisocially in situations where the opportunity presented itself.

Measuring the criminal personality

The notion that personality can be measured is one that is central to Eysenck's theory. He developed the *Eysenck Personality Questionnaire* (EPQ), a form of psychological test which locates respondents along the E, N and P dimensions to determine their personality type. The measurement of personality was a very important part of Eysenck's theory because it enabled him to conduct research relating personality variables to other behaviours, such as criminality.

Apply it Concepts — Three offenders

Margaret Tibbs is a company accountant for a small firm and has been stealing small amounts of money from petty cash for years. Since joining the firm 18 years ago, Margaret has stolen several thousands of pounds. She is quiet, unassuming and does not have a great many friends at work.

Vince Douglas is a family man with a highly-paid job. His many friends would describe him as a 'steady bloke' who is well-adjusted. Vince is also a serial killer. He has murdered dozens of women over the years, leaves no evidence at the scene and disposes of the bodies without a trace. Vince tells his wife of 25 years that he often stays behind at the office and she has no reason to disbelieve him.

Barry Phillips is a self-confessed 'boy racer'. He has been convicted of stealing cars and spent time in a young offender institution. He had a six-month suspended sentence for burglary and has since had to wear an electronic tag. Barry sees a counsellor regularly to help him with his depression.

Questions

1. Which of the three cases above most clearly fits Eysenck's description of the criminal personality? Explain your answer.
2. How could the other two cases be seen as criticisms of Eysenck's theory?

Practical activity on page 346

Evaluation

Research support

One strength of Eysenck's theory is there is evidence to support the criminal personality.

Sybil Eysenck and Hans Eysenck (1977) compared 2070 prisoners' scores on the *Eysenck Personality Questionnaire* (EPQ) with 2422 **controls**. On measures of extraversion, neuroticism and psychoticism – across all the age groups that were sampled – prisoners recorded higher average scores than controls.

This agrees with the predictions of the theory that offenders rate higher than average across the three dimensions Eysenck identified.

Counterpoint However, David Farrington *et al.* (1982) conducted a **meta-analysis** of relevant studies and reported that offenders tended to score high on measures of psychoticism, but not for extraversion and neuroticism. There is also inconsistent evidence of differences on **EEG** measures (used to measure cortical arousal) between extraverts and introverts (Küssner 2017) which casts doubt on the physiological basis of Eysenck's theory.

This means some of the central assumptions of the criminal personality have been challenged.

Too simplistic

One limitation is the idea that all offending behaviour can be explained by personality traits alone.

Terrie Moffitt (1993) drew a distinction between offending behaviour that only occurs in adolescence (adolescence-limited) and that which continues into adulthood (life-course-persistent). She argued that personality traits alone were a poor predictor of how long offending behaviour would go on for, in the sense of whether someone is likely to become a 'career offender'. She considered persistence in offending behaviour to be the result of a reciprocal process between individual personality traits on the one hand, and environmental reactions to those traits on the other.

This presents a more complex picture than Eysenck suggested, that the course of offending behaviour is determined by an interaction between personality and the environment.

Cultural factors

A further limitation of Eysenck's theory is that cultural factors are not taken into account.

The criminal personality may vary according to culture. Curt Bartol and Howard Holanchock (1979) studied Hispanic and African-American offenders in a maximum security prison in New York. The researchers divided these offenders into six groups based on their offending history and the nature of their offences. It was found that all six groups were less extravert than a non-offender control group whereas Eysenck would expect them to be more extravert. Bartol and Holanchock suggested that this was because the sample was a very different cultural group from that investigated by Eysenck.

This questions how far the criminal personality can be generalised and suggests it may be a culturally relative concept.

Evaluation eXtra

Measuring personality

Eysenck's theory offers a way to measure personality through the use of a psychological test, the EPQ. This means we can see how the criminal personality differs from the rest of the population across different dimensions.

However, critics have suggested that personality type may not be reducible to a 'score' in this way. The suggestion is that personality – if indeed such a thing exists – is too complex and dynamic to be quantified. And this would also apply to a personality deemed to be 'criminal'.

Consider: *Is the EPQ a useful tool?*

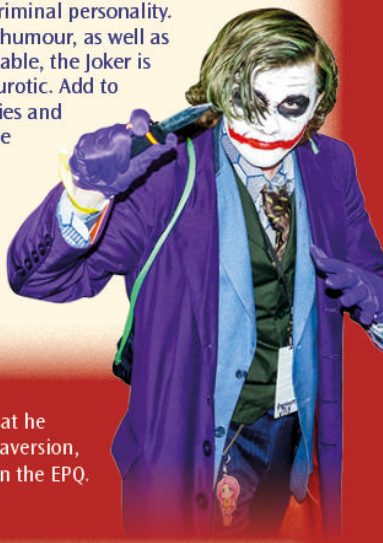
Apply it
Concepts

The criminal personality on film

Few characters in movie history fit the profile of the archetypal baddie quite as well as Batman's arch enemy, the Joker. Both fascinating and terrifying in equal measure, the Joker ticks every box with respect to Eysenck's criminal personality. Possessed of a warped, wisecracking humour, as well as being unpredictable and hugely unstable, the Joker is the very epitome of the extravert-neurotic. Add to this, his chilling, murderous tendencies and a high score on the psychoticism scale would seem to be assured!

Question

Apart from the Joker, can you think of any other screen villains who would match Eysenck's description of the criminal personality? Explain your choices in each case.



The Joker. Probably a fair bet that he would score pretty high for extraversion, neuroticism and psychoticism on the EPQ.

Apply it
Methods

Comparing E, N and P scores in offenders and non-offenders

A researcher wanted to investigate whether there is a difference in personality type between offenders and non-offenders. She administered the EPQ to a group of young offenders and a group of students. It was found that the group of young offenders scored significantly higher than the students on measures of extraversion, neuroticism and psychoticism.

Questions

1. What type of **experiment** is the investigation above? Explain your answer. (3 *marks*)
2. Explain *one* limitation of the type of experiment you have identified in question 1. Refer to the investigation above in your answer. (3 *marks*)
3. Explain how the **dependent variable** has been **operationalised** in the investigation above. (2 *marks*)
4. Identify which type of data would be produced in the investigation above. (1 *mark*)
5. Explain *one* strength and *one* limitation of the type of data you identified in question 4. Refer to the investigation above in your answer. (6 *marks*)

Check it

1. Briefly explain Eysenck's theory of the criminal personality. *[4 marks]*
2. Explain the difference between biological and psychological explanations of offending behaviour. *[4 marks]*
3. Identify **and** explain **two** criticisms of Eysenck's theory of the criminal personality. *[4 marks]*
4. Discuss Eysenck's theory of the criminal personality. *[16 marks]*

Psychological explanations: Cognitive

The specification says...

Psychological explanations of offending behaviour: cognitive explanations; level of moral reasoning and cognitive distortions, including hostile attribution bias and minimalisation.

There is often talk in the media about what is going on in the mind of an offender – what were they thinking?! This suggests that criminal activity might have a cognitive basis.

Here we explore two examples of cognitive explanations for offending. First, a theory that builds on the work of Lawrence Kohlberg which claims that crimes may be committed by individuals who have a lower level of moral reasoning than those who have not committed a crime. Second, the idea that offender behaviour is the result of faulty information processing in the minds of offenders, so-called cognitive distortions.

Key terms

Level of moral reasoning Moral reasoning refers to the way a person thinks about right and wrong. It is presumed that such thinking then applies to moral behaviour. The higher the level, the more that behaviour is driven by a sense of what is right and the less it is driven by just avoiding punishment or avoiding the disapproval of others.

Cognitive distortions Faulty, biased and irrational ways of thinking that mean we perceive ourselves, other people and the world inaccurately and usually negatively.

Hostile attribution bias The tendency to judge ambiguous situations, or the actions of others, as aggressive and/or threatening when in reality they may not be.

Minimalisation (or minimisation) A type of deception that involves downplaying the significance of an event or emotion. A common strategy when dealing with feelings of guilt.



Someone with a hostile attribution bias might interpret this facial expression as confrontational.

Level of moral reasoning

Moral development

Lawrence Kohlberg (1968) was the first researcher to apply the concept of moral reasoning to offending behaviour. Kohlberg proposed that people's decisions and judgements on issues of right and wrong can be summarised in a stage theory of moral reasoning (see facing page) – the higher the stage, the more sophisticated the reasoning. Kohlberg based his theory on people's responses to a series of moral dilemmas, such as the *Heinz dilemma* (also on facing page).

Many studies have suggested that offenders tend to show a lower **level of moral reasoning** than non-offenders. Kohlberg *et al.* (1973), using his moral dilemmas, found that a group of violent youths were at a **significantly** lower level of moral development than non-violent youths – even after controlling for social background.

Link with criminality

Offenders are more likely to be classified at the *pre-conventional level* of Kohlberg's model (stages 1 and 2), whereas non-offenders have generally progressed to the *conventional level* and beyond. The pre-conventional level is characterised by a need to avoid punishment and gain rewards, and is associated with less mature, childlike reasoning. Thus, adults and adolescents who reason at this level may commit **crime** if they can get away with it or gain rewards in the form of money, increased respect, etc.

This assumption is supported by studies which suggest that offenders are often more egocentric (self-centred) and display poorer social perspective-taking skills (see page 186) than non-offender peers (e.g. Chandler 1973). Individuals who reason at higher levels tend to sympathise more with the rights of others and exhibit more conventional behaviours such as honesty, generosity and non-violence.

Cognitive distortions

Cognitive distortions are errors or biases in people's information processing system characterised by faulty thinking. We all occasionally show evidence of faulty thinking when explaining our own behaviour (especially if the behaviour was unexpected or out of character) but research has linked this to the way in which offenders interpret other people's behaviour and justify their own actions.

Two examples of cognitive distortions are **hostile attribution bias** and **minimalisation**.

Hostile attribution bias

Evidence suggests that a propensity for violence is often associated with a tendency to misinterpret the actions of other people – in other words, to assume others are being confrontational when they are not. This is called a hostile attribution bias. Offenders may misread non-aggressive cues (such as being 'looked at') and this may trigger a disproportionate, often violent, response. Michael Schönenberg and Aiste Jusyte (2014) presented 55 violent offenders with images of emotionally ambiguous facial expressions. When compared with a non-aggressive matched **control group**, the violent offenders were significantly more likely to perceive the images as angry and hostile.

The roots of this behaviour may be apparent in childhood. Kenneth Dodge and Cynthia Frame (1982) showed children a video clip of an 'ambiguous provocation' (where the intention was neither clearly hostile nor clearly accidental). Children who had been identified as 'aggressive' and 'rejected' prior to the study interpreted the situation as more hostile than those classed as 'non-aggressive' and 'accepted'.

Minimalisation

Minimalisation is an attempt to deny or downplay the seriousness of an offence and has elsewhere been referred to as the application of a 'euphemistic label' for behaviour (Bandura 1973). For instance, burglars may describe themselves as 'doing a job' or 'supporting my family' as a way of minimising the seriousness of their offences. Studies suggest that individuals who commit sexual offences are particularly prone to minimalisation. Howard Barbaree (1991) found among 26 incarcerated rapists, 54% denied they had committed an offence at all and a further 40% minimised the harm they had caused to the victim.

Evaluation

Research support

One strength is evidence for the link between level of moral reasoning and crime.

Emma Palmer and Clive Hollin (1998) compared moral reasoning in 332 non-offenders and 126 convicted offenders using the *Socio Moral Reflection Measure Short Form (SRM-SF)* which contains 11 moral dilemma-related questions such as not taking things that belong to others and keeping a promise to a friend. The offender group showed less mature moral reasoning than the non-offender group.

This is consistent with Kohlberg's predictions.

Type of offence

One limitation is that the level of moral reasoning may depend on the offence.

David Thornton and R. L. Reid (1982) found that people who committed crimes for financial gain (e.g. robbery) were more likely to show pre-conventional moral reasoning than those convicted of impulsive crimes (e.g. assault). Pre-conventional moral reasoning tends to be associated with crimes in which offenders believe they have a good chance of evading punishment.

This suggests that Kohlberg's theory may not apply to all forms of crime.

Evaluation eXtra

Thinking versus behaviour

Kohlberg's theory is useful in that it provides insight into the mechanics of the criminal mind – that offenders may be more childlike and egocentric when it comes to making moral judgements than the law-abiding majority.

However, moral thinking is not the same as moral *behaviour*. Moral reasoning of the kind Kohlberg was interested in is more likely used to justify behaviour *after* it has happened (Krebs and Denton 2005).

Consider: *Is it best to know how offenders think or how they behave?*

Evaluation

Real-world application

One strength of cognitive distortions is its application to therapy.

Cognitive behaviour therapy aims to challenge irrational thinking. In the case of offending behaviour, offenders are encouraged to 'face up' to what they have done and establish a less distorted view of their actions. Studies (e.g. Harkins *et al.* 2010) suggest that reduced incidence of denial and minimalisation in therapy is highly associated with a reduced risk of reoffending (as 'acceptance' of one's crimes is thought to be an important aspect of rehabilitation).

This suggests that the theory of cognitive distortions has practical value.

Type of offence

One limitation is the level of cognitive distortion depends on the type of offence.

Dennis Howitt and Kerry Sheldon (2007) gathered questionnaire responses from sexual offenders. Contrary to what the researchers predicted, they found that non-contact sex offenders (accessed sexual images on the internet) used more cognitive distortions than contact sex offenders (had physically abused children). Those who had a previous history of offending were also more likely to use distortions as a justification.

This suggests that distortions are not used in the same way by all offenders.

Evaluation eXtra

Descriptive or explanatory?

Cognitive theories of offending are good at describing the criminal mind. They may also help in reducing reoffending in the long term as, for instance, understanding that offenders minimalise their crimes may be a useful starting point in therapy.

However, cognitive theories do not help in predicting future offender behaviour – just because someone tends to have distorted thinking doesn't inevitably mean they will become an offender.

Consider: *Are cognitive explanations descriptive or explanatory?*

Apply it Concepts — The Heinz dilemma

This is one of the moral dilemmas Kohlberg used in his research:

In Europe, a woman was near death from a special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging ten times what the drug cost him to make. He paid $400 for the radium and charged $4000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about $2000, which was half of what the drug cost. He told the druggist that his wife was dying and asked him to sell it cheaper or let him pay later. But the druggist said, 'No, I discovered the drug and I'm going to make money from it'. So Heinz got desperate and considered breaking into the man's store to steal the drug for his wife.

Participants were then asked various questions, including: Should Heinz steal the drug? Why (or why not)? Does the druggist have the right to charge what he likes for the drug? What if the dying person were a stranger, should he steal the drug?

Question

Answer the questions above yourself. Based on your answers, where would you place yourself in Kohlberg's model below?

Level I **Pre-conventional morality**	Stage 1 Punishment orientation *Rules are obeyed to avoid punishment*
	Stage 2 Instrumental orientation or personal gain *Rules are obeyed for personal gain*
Level II **Conventional morality**	Stage 3 'Good boy' or 'Good girl' orientation *Rules are obeyed for approval*
	Stage 4 Maintenance of the social order *Rules are obeyed to maintain social order*
Level III **Post-conventional morality**	Stage 5 Morality of contract and individual rights *Rules are challenged if they infringe on the rights of others*
	Stage 6 Morality of conscience *Individuals have a personal set of ethical principles*

Apply it Methods — Kohlberg's methods

Kohlberg interviewed his participants using dilemmas (e.g. Heinz, above). Based on their responses he would identify their stage of moral development.

Questions

1. What are the difficulties with categorising responses in this way? (*4 marks*)
2. Describe *one* way in which Kohlberg could have improved the **reliability** of his categorisation system. (*3 marks*)
3. Outline what is meant by a **structured interview**. (*2 marks*)
4. Briefly evaluate the use of structured interviews in psychological research. Refer to Kohlberg's research in your answer. (*6 marks*)

Check it

1. Explain **one** limitation of **one** cognitive explanation of offending. *[4 marks]*
2. Outline levels of moral reasoning as an explanation of offending behaviour. *[6 marks]*
3. Using examples, explain what is meant by 'cognitive distortion'. *[4 marks]*
4. Discuss cognitive explanations of offending. *[16 marks]*

Psychological explanations: Differential association theory

The specification says...

Psychological explanations of offending behaviour: differential association theory.

Differential association is a social learning theory of offending which has stood the test of time, first proposed by sociologist Edwin Sutherland in the 1920s. The theory suggests that offending is learned in the same way as any other behaviour – through the relationships and associations we form with the people around us.

At the time it was written, Sutherland's theory represented a departure from previous accounts which tended to assume offending was genetically determined or due to some kind of weakness of character. Differential association has remained an influential theory ever since.

Key term

Differential association theory An explanation for offending which proposes that, through interaction with others, individuals learn the values, attitudes, techniques and motives for offending behaviour.

Differential association theory

Differential association theory proposes that individuals learn the values, attitudes, techniques and motives for offending behaviour through association and interaction with different people i.e. one person might associate with people who have very negative attitudes towards crime while another person may be exposed to more positive attitudes (hence, *differential* association).

Scientific basis

Edwin Sutherland set himself the task of developing a set of scientific principles that could explain all types of offending – that is, 'the conditions which are said to cause crime should be present when crime is present, and they should be absent when crime is absent' (Sutherland 1924). His theory was and is designed to discriminate between individuals who become offenders and those who do not, whatever their social class or ethnic background.

Offending as a learned behaviour

Offending behaviour may be acquired in the same way as any other behaviour through the processes of learning. This learning occurs most often through interactions with significant others who the child values most and spends most time with, such as the family and peer group.

Differential association suggests that it should be possible to mathematically predict how likely it is that an individual will commit offences. To do this we need to know the frequency, intensity and duration of exposure to deviant and non-deviant norms and values.

Offending arises from two factors: *learned attitudes towards offending*, and the *learning of specific offending acts/techniques*.

Learning attitudes When a person is socialised into a group they will be exposed to values and attitudes towards the law. Some of these values will be pro-crime, some of these will be anti-crime. Sutherland argues that if the number of pro-criminal attitudes the person comes to acquire outweighs the number of anti-criminal attitudes, they will go on to offend. The learning process is the same whether a person is learning offending or conformity to the law (or anything else for that matter).

Learning techniques In addition to being exposed to pro-crime attitudes, the would-be offender may also learn particular techniques for committing offences. These might include how to break into someone's house through a locked window or how to disable a car stereo before stealing it.

Socialisation in prison

As well as offering an account of how offending may 'breed' amongst specific social groups and in communities, Sutherland's theory can also account for why so many convicts released from prison go on to reoffend. It is reasonable to assume that whilst inside prison inmates will learn specific techniques of offending from other, more experienced offenders that they may put into practice upon their release. This learning may occur through observational learning and imitation or direct tuition from offending peers.

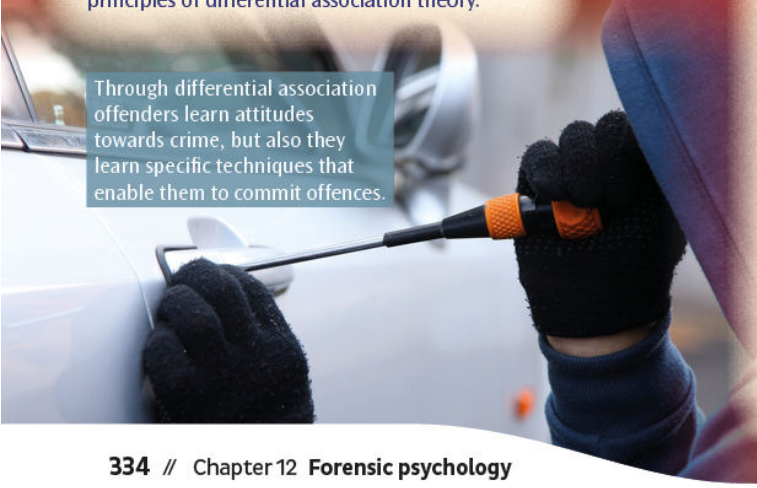
Apply it Concepts — Gertruda

Growing up, Gertruda was generally considered to be a good girl. She came from a stable background with supportive parents and always performed well at school.

Since turning 15, Gertruda has started to hang around with a new group of friends. Locally, the group has a reputation for being 'the wrong crowd'. Despite being told to stay away from this group by her parents and her former friends, Gertruda continues to associate with them. Last week, she was arrested for trying to steal a car – her first offence.

Question

With reference to Gertruda, outline the main principles of differential association theory.



Through differential association offenders learn attitudes towards crime, but also they learn specific techniques that enable them to commit offences.

Apply it Concepts — Farrington *et al.* (2006)

The *Cambridge Study in Delinquent Development* was a prospective longitudinal survey of the development of offending and antisocial behaviour in 411 boys. The study began when the boys were aged 8 in 1961 and all living in a deprived, inner-city area of South London.

Of the boys/men sampled, 41% were convicted of at least one offence between age 10 and age 50. The average conviction career lasted from age 19 to 28 and included five convictions. The most important childhood 'risk factors' at age 8–10 for later offending were measures of family criminality, daring or risk-taking, low school attainment, poverty and poor parenting.

A small proportion of participants (7%) were defined as 'chronic offenders' because they accounted for about half of all officially recorded offences in this study.

Question

How do the findings of this study and the key 'risk factors' identified support differential association theory?

Evaluation

Shift of focus

One strength of differential association theory is, at the time it was first published, it changed the focus of offending explanations.

Sutherland was successful in moving the emphasis away from early biological accounts of offending, such as Lombroso's **atavistic theory** (page 326), as well as away from theories that explained offending as being the product of individual weakness or immorality. Differential association theory draws attention to the fact that deviant social circumstances and environments may be more to blame for offending than deviant people.

This approach is more desirable because it offers a more realistic solution to the problem of offending instead of **eugenics** (the biological solution) or punishment (the morality solution).

Counterpoint Having said that, differential association runs the risk of stereotyping individuals who come from impoverished, crime-ridden backgrounds as 'unavoidably offenders' – even though Sutherland took great care to point out that offending should be considered on an individual case-by-case basis. However, the theory tends to suggest that exposure to pro-crime values is sufficient to produce offending in those who are exposed to it.

This ignores the fact that people may choose not to offend despite such influences, as not everyone who is exposed to pro-crime attitudes goes on to offend.

Wide reach

Another strength is that the theory can account for offending within all sectors of society.

Whilst Sutherland recognised that some types of offence, such as burglary, may be clustered within certain inner-city, working-class communities, it is also the case that some offences are clustered amongst more affluent groups in society. Sutherland was particularly interested in so-called 'white-collar' or corporate offences (indeed he coined the term *white-collar crime* in a speech delivered in 1939) and how this may be a feature of middle-class social groups who share deviant norms and values.

This shows that it is not just the 'lower' classes who commit offences and that the principles of differential association can be used to explain all offences.

Difficulty testing

One limitation is it is difficult to test the predictions of differential association.

Sutherland aimed to provide a scientific, mathematical framework within which future offending behaviour could be predicted and this means that the predictions must be testable. The problem is that many of the concepts are not testable because they cannot be **operationalised**. For example, it is hard to see how the number of pro-crime attitudes a person has, or has been exposed to, could be measured. Similarly, the theory is built on the assumption that offending behaviour will occur when pro-crime values outnumber anti-crime ones. Without being able to measure these, we cannot know at what point the urge to offend is realised and the offending career triggered.

This means the theory does not have scientific credibility.

Evaluation eXtra

Nurture or nature?

Sutherland suggested that the response of the family is crucial in determining whether an individual is likely to engage in offending. If the family is seen to support offending activity, making it seem legitimate and reasonable, then this becomes a major influence on the child's value system. In the Farrington *et al.* study (facing page), such intergenerational offending was a key feature of the findings.

However, the fact that offending behaviour often seems to 'run in families' could also be interpreted as supporting other explanations, such as biological theories. A particular combination of genes, or innate neural abnormality, that predisposes the person to offend may be inherited from family members.

Consider: *Which of these arguments is most persuasive?*

Apply it Methods

You do the maths

Answer the following questions on the Farrington *et al.* study (facing page).

Questions

1. 41% of the sample of 411 participants went on to commit at least one offence. How many participants is this? (*1 mark*)
2. What is the ratio of participants who went on to commit offences compared to those who did not commit offences? (*1 mark*)
3. 7% of the sample of 411 were defined as 'chronic offenders'. How many participants is this? (*1 mark*)
4. Express 7% of 411 as a fraction and as a decimal. (*2 marks*)
5. What graphical display would be most suitable to represent the percentage of participants who went on to commit offences and those who did not? Explain your answer. (*2 marks*)



Sutherland first used the term 'white-collar crime' in 1938 to describe financially-motivated non-violent crime committed by business and government professionals.

Study tip

One important skill that you must develop at A level is the skill of *comparison*. One way of evaluating the worth of a particular theory or explanation is by examining how it compares with alternatives. Effective comparison does more than just list similarities and differences. Instead, it uses the key features of one theory, approach or treatment to point out the strengths and/or shortcomings of another.

Compare differential association with the other biological and psychological explanations of offending. What are the similarities and differences with each approach? Which do you consider to be the most valid in accounting for the emergence and persistence of offending behaviour?

Remember, you must present evidence to support your judgements rather than just relying on your own opinion.

Check it

1. Outline the differential association theory of offending. *[4 marks]*
2. Explain **one** difference between differential association theory **and one** other psychological theory of offending behaviour. *[4 marks]*
3. Briefly evaluate the differential association theory of offending. *[6 marks]*
4. Discuss the differential association theory of offending. *[16 marks]*

Psychological explanations: Psychodynamic

The specification says...

Psychological explanations of offending behaviour: psychodynamic explanations.

All psychodynamic explanations originate from the work of Sigmund Freud. Although Freud did not address the issue of offending behaviour himself, other researchers have attempted to apply some of his key concepts to offending.

Here, we focus on two psychodynamic explanations: Ronald Blackburn's idea of the inadequate Superego and John Bowlby's maternal deprivation theory (which you studied in Year 1). Both of these explanations abide by the Freudian principle that the roots of (offending) personality are formed in childhood.

Key term

Psychodynamic explanations A perspective that describes the different forces (dynamics), most of which are unconscious, that operate on the mind and direct human behaviour and experience.

Apply it Concepts

Harry, Barry and Gary

Barry has never met his dad, he left Barry's mother before Barry was born.

Harry does live with his dad but Harry's dad makes his 'living' as a burglar.

Gary's parents are extremely strict, yet he is always in trouble with the local police. It is almost as if Gary enjoys being in trouble.

Barry, Harry and Gary are all serving prison sentences.

Question

How would a psychodynamic psychologist explain this?



Did this woman experience maternal deprivation as an infant?

Psychodynamic explanations of offending

The inadequate Superego

You may recall that the **Superego**, alongside the **Id** and the **Ego**, make up the tripartite structure of personality. The Superego is formed at the end of the **phallic stage** of development when children resolve the **Oedipus complex** (sometimes referred to as the **Electra complex** in girls – both complexes are described on page 18). The Superego works on the *morality principle* and exerts its influence by punishing the Ego through guilt for wrongdoing, whilst rewarding it with pride for good moral behaviour.

Ronald Blackburn (1993) argued that if the Superego is somehow deficient or inadequate then offending behaviour is inevitable because the Id is given 'free rein' and not properly controlled. Three types of inadequate Superego have been proposed:

1. *The weak Superego* – if the same-gender parent is absent during the phallic stage, a child cannot **internalise** a fully-formed Superego as there is no opportunity for **identification**. This would make immoral or offending behaviour more likely.
2. *The deviant Superego* – if the Superego that a child internalises has immoral or deviant values this would lead to offending behaviour. For instance, a boy who is raised by a criminal father is not likely to associate guilt with wrongdoing.
3. *The over-harsh Superego* – a healthy Superego is based on identification with a parent who has firm rules but forgives transgressions. In contrast an excessively punitive or overly harsh parenting style leads to a child with an over-harsh Superego who is crippled by guilt and anxiety. This may (unconsciously) drive the individual to perform criminal acts in order to satisfy the Superego's overwhelming need for punishment.

The role of emotion The effect of an inadequate Superego (weak, deviant or over-harsh) is to allow primitive, emotional demands to become uppermost in guiding moral behaviour. This is a key feature of the psychodynamic approach and marks it out as different from the other explanations of crime that we have looked at. The psychodynamic approach deals with the *emotional* life of the individual – for example, it acknowledges the role of anxiety and guilt in the development of offending behaviour. This also means that lack of guilt is relevant to understanding offending behaviour, as in the case of **maternal deprivation** theory which we are about to consider.

Theory of maternal deprivation

In your A level studies you have learned about John Bowlby's (1944) theory of maternal deprivation. He argued that the ability to form meaningful relationships in adulthood was dependent upon the child forming a warm, continuous relationship with a mother-figure. Failure to establish such a relationship during the first few years of life means a child is likely to experience a number of damaging and irreversible consequences in later life.

One of these is the development of a particular personality type, known as **affectionless psychopathy**, characterised by a lack of guilt, empathy and feeling for others. Such maternally deprived individuals are likely to engage in acts of delinquency and cannot develop close relationships with others.

44 juvenile thieves Bowlby (1944) supported his claims with his own investigation of 44 juvenile thieves. He found, through **interviews** with the thieves and their families, that 14 of the sample he studied showed personality and behavioural characteristics that could be classified as affectionless psychopathy. Of this 14, 12 had experienced prolonged separation from their mothers during infancy (in particular, the first two years of their lives). In a non-offender group, only two had experienced similar early separation. Bowlby concluded that the effects of maternal deprivation had caused affectionless and delinquent behaviour among the juvenile thieves.

Study tip

Remember how Freud says the Superego comes about (described on page 18)? Children in the phallic stage (that's 3 to 6 years old) experience the Oedipus or Electra complex. They resolve this by identifying with the same-sex parent and wanting to be like them. This leads to internalisation of the same-sex parent's Superego, that is, children take on board the values and moral beliefs of the same-sex parent. Thus, the Superego the child gets arrives second-hand and becomes their internal parent (or conscience) from then on.

Evaluation

Research support

One strength of the psychodynamic approach is research support for the link between offending and the Superego.

Miroslav Goreta (1991) conducted a Freudian-style analysis of ten offenders referred for psychiatric treatment. In all those assessed, disturbances in Superego formation were diagnosed. Each offender experienced unconscious feelings of guilt and the need for self-punishment. Goreta explained this as a consequence of an over-harsh Superego, the need for punishment manifesting itself as a desire to commit acts of wrongdoing and offend.

This evidence seems to support the role of psychic conflicts and an over-harsh Superego as a basis for offending.

Counterpoint Generally however, the central principles of the inadequate Superego theory are not supported. If this theory were correct we would expect harsh, punitive parents to raise children who constantly experience feelings of guilt and anxiety. Evidence suggests, however, that the opposite is true. Parents who rely on harsher forms of discipline tend to raise children who are rebellious and rarely express feelings of guilt or self-criticism (Kochanska *et al.* 2001).

This calls into question the relationship between a strong, punitive internal parent and excessive feelings of guilt within the child.

Gender bias

One limitation of Freudian theory is that it is gender-biased.

An implicit assumption within Freud's theory is that girls develop a weaker Superego than boys because identification with the same-gender parent is not as strong. This is because girls do not experience the intense emotion associated with castration anxiety, and therefore are under less pressure to identify with their mothers (than boys are with their fathers). Therefore, according to Freud, their Superego (and consequently their sense of morality) is less fully realised. The implication of this is that women should be more prone to offending behaviour than men. Rates of imprisonment show that the opposite is more likely to be true (in the UK about 20 times more men are in prison than women). In a study where children were required to resist temptation, Martin Hoffman (1975) found hardly any evidence of gender differences, and when there was, little girls tended to be more moral than little boys.

This suggests there is alpha bias at the heart of Freud's theory and means it may not be appropriate as an explanation of offending behaviour.

Other factors

Another limitation of the psychodynamic approach to offending is that Bowlby's theory is only based on an association between maternal deprivation and offending.

Hilda Lewis (1954) analysed data drawn from interviews with 500 young people and found that maternal deprivation was a poor predictor of future offending and the ability to form close relationships in adolescence. Even if there is a link between children who have experienced frequent or prolonged separation from their mothers and offending in later life, this is not necessarily a causal relationship. There are countless other reasons for this apparent link, for example the maternal deprivation may be due to growing up in poverty – and this might then explain later offending.

This suggests that maternal deprivation may be one of the reasons for later offending behaviour, but not the only reason.

Evaluation eXtra

Contribution

Psychodynamic explanations were some of the first to link early experience in childhood to moral behaviour and offending – something that is now regarded as common sense in contemporary criminology. Psychodynamic explanations also drew attention to the emotional basis of offending, a factor that is largely ignored by other explanations (e.g. cognitive theories).

However, the many unconscious concepts within psychodynamic theory are not open to empirical testing. In the absence of supporting evidence, arguments such as the inadequate Superego can only be judged on their face value rather than their scientific worth.

Consider: *Does the contribution of psychodynamic theory outweigh its lack of scientific rigour?*

Apply it Concepts

The case of Jim

Jim spent the first five years of his life in a children's home as his alcoholic parents were judged unfit to take care of him.

Jim is 15 and has very few close friends. His most recent school report described him as 'lacking empathy' and his progress grades are among the lowest in the class. In the last few weeks, Jim has also started to get in trouble with the police. He has a criminal record for vandalism after damaging a bus shelter and has started stealing from the local shop.

Questions

1. How would Blackburn's inadequate Superego theory explain Jim's recent offending behaviour?
2. How would Bowlby's maternal deprivation theory explain Jim's recent offending behaviour?
3. Briefly evaluate *one* of the explanations given above. Refer to Jim's behaviour in your answer.

The feminist writer Germaine Greer suggested in her 1984 book *Sex and Destiny* that Bowlby made mothers feel guilty – if they returned to work and were not fully available to their children they may be creating juvenile delinquents.



Apply it Methods

The case of Jim (revisited)

Jim has recently been referred to a psychologist who has conducted a case study of Jim's life. The psychologist has conducted interviews and naturalistic observations with Jim as well as talking to his teachers and care workers at the children's home. He has concluded that Jim's offending behaviour is a result of his early childhood experiences.

Questions

1. Outline what is meant by a **case study**. Refer to Jim and his psychologist in your answer. (3 *marks*)
2. Briefly evaluate the use of case studies in psychological research. Refer to Jim and his psychologist in your answer. (6 *marks*)
3. Outline the main features of a **naturalistic observation**. (2 *marks*)
4. Explain *one* strength and *one* limitation of the use of naturalistic observations as applied to this study. (2 *marks* + 2 *marks*)

Check it

1. Outline **one** psychodynamic explanation of offending. *[4 marks]*
2. Outline what research has shown about the psychodynamic explanation of offending. *[4 marks]*
3. Briefly evaluate **one** psychodynamic explanation of offending. *[6 marks]*
4. Discuss psychodynamic explanations of offending. *[16 marks]*

Dealing with offending behaviour: Custodial sentencing

The specification says...

Dealing with offending behaviour: the aims of custodial sentencing and the psychological effects of custodial sentencing. Recidivism.

There are a number of ways in which different societies deal with offending behaviour but the most common form of punishment is custodial sentencing (prison). Surveys in this country suggest that the majority of the public would like to see harsher conditions in prison and tougher sentences – but does prison work?

Here, we address this question by considering the aims of prison (what it is designed to achieve), its effectiveness, (with reference to rates of recidivism) and the psychological effects of the prison system.

Key terms

Custodial sentencing A decision made by a court that punishment for a crime should involve time being in 'custody' – prison (incarceration) or in some other closed therapeutic and/or educational institution, such as a psychiatric hospital.

Recidivism Reoffending, a tendency to relapse into a previous condition or mode of behaviour. In the context of crime, a convicted offender who reoffends, usually repeatedly.

Activity

Apply it

Concepts

Aims of custodial sentencing

The following excerpt is taken from a prosecution lawyer's closing statement in court:

'I think you'll agree, ladies and gentlemen of the jury, that Keith Catflap – the notorious serial burglar who stands accused of yet another crime – should be sent to prison for a very long time. As we have seen, he has caused immense suffering to families over the years – now it's his turn to pay with the loss of his liberty. At least then the public will be safe and he might eventually mend his ways. It might also send a message to others that crimes of this nature do not pay.'

Question

Outline *four* aims of custodial sentencing. Refer to the closing statement above in your answer.



Life behind bars. But is custodial sentencing the best way to deal with offending behaviour?

Custodial sentencing

Aims of custodial sentencing

Custodial sentencing involves a convicted offender spending time in prison or another closed institution such as a young offender's institute or psychiatric hospital. There are four main reasons for doing this:

1. Deterrence The unpleasant prison experience is designed to put off the individual (or society at large) from engaging in offending behaviour. Deterrence works on two levels: *general deterrence* aims to send a broad message to members of a given society that **crime** will not be tolerated. *Individual deterrence* should prevent the individual from repeating the same offences in light of their experience. In other words, this view is based on the **behaviourist** idea of conditioning through vicarious **punishment**.

2. Incapacitation The offender is taken out of society to prevent them reoffending as a means of protecting the public. The need for incapacitation is likely to depend upon the severity of the offence and the nature of the offender. For instance, individuals in society will require more protection from a serial murderer or rapist than an elderly person who refuses to pay their council tax.

3. Retribution Society is enacting revenge for the offence by making the offender suffer, and the level of suffering should be proportionate to the seriousness of the offence. This is based on the biblical notion of an 'eye for an eye', that the offender should in some way pay for their actions. Many people see prison as the best possible option in this sense and alternatives to prison are often criticised as soft options.

4. Rehabilitation In contrast to the above, many people would see the main objective of prison as not being purely to punish, but to reform. Upon release, offenders should leave prison better adjusted and ready to take their place back in society. Prison should provide opportunities to develop skills and training or to access treatment programmes (e.g. for drug addiction or anger), as well as give the offender the chance to reflect on their offence.

Psychological effects of custodial sentencing

There are several psychological effects associated with serving time in prison:

- **Stress and depression** Suicide rates are considerably higher in prison than in the general population, as are incidents of self-mutilation and self-harm. The stress of the prison experience also increases the risk of developing psychological disorders following release.
- **Institutionalisation** Having adapted to the norms and routines of prison life, inmates may become so accustomed to these that they are no longer able to function on the outside.
- **Prisonisation** Refers to the way in which prisoners are socialised into adopting an 'inmate code'. Behaviour that may be considered unacceptable in the outside world may be encouraged and rewarded inside the walls of the institution.

The problem of recidivism

Recidivism refers to reoffending. Recidivism rates in ex-prisoners tell us to what extent prison acts as an effective deterrent.

It is difficult to obtain clear figures for recidivism rates for various reasons, for example it depends whether you are looking at reoffending within a year of release or a longer period. Typically in the UK the Ministry of Justice reports proven figures within one year of release ('proven' means the person has been caught). In recent years the UK figure has been about 45% (e.g. Yukhnenko *et al.* 2019, based on Ministry of Justice figures).

Reoffending rates vary with time period after release, age of offender, crime committed and country. The US, Australia and Denmark regularly record rates in excess of 60%. In Norway rates may be as low as 20% (Yukhnenko *et al.*). This last figure is significant because in Norway there is less emphasis on incarceration and greater emphasis on rehabilitation and skills development than elsewhere.

Study tip

Note that this topic covers two distinct issues: the aims of custodial sentencing and the psychological effects of custodial sentencing. The evaluation points on the facing page can be applied to both.

Evaluation

Psychological effects

One limitation of custodial sentencing is the negative psychological effect on prisoners.

Curt Bartol (1995) has suggested that, for many offenders, imprisonment can be 'brutal, demeaning and generally devastating'. According to the Ministry of Justice a record 119 people killed themselves in prisons in England and Wales in 2016 – an increase of 29 (32%) on the previous year (*The Guardian* 2017). This equates to an average suicide of one every three days – almost nine times higher than in the general population. Most at risk are young single men during the first 24 hours of confinement. A study conducted by the Prison Reform Trust (2014) found that 25% of women and 15% of men in prison reported symptoms of psychosis (e.g. schizophrenia).

This supports the view that oppressive prison regimes may be detrimental to psychological health which could impact on rehabilitation.

Counterpoint The figures in the Prison Reform Trust study above do not include the number of inmates who were experiencing psychotic symptoms before they were incarcerated. Many of those convicted may have pre-existing psychological and emotional difficulties at the time they were convicted (and this may explain their offending behaviour in the first place). The *importation model* (page 306) argues that prisoners may import some of their psychological problems so we do not know if this is a problem with the prison regime, or something else – such as the trauma of being locked away regardless of what the prison is like.

This suggests there may be **confounding variables** that influence the link between prison and its psychological effects.

Training and treatment

One strength of custodial sentencing is it provides opportunity for training and treatment.

One objective of imprisonment is rehabilitation – offenders may become better people during their time in prison, and their improved character means they may be able to lead a crime-free life when back in society. Many offenders access education and training whilst in prison increasing the possibility they will find employment upon release. The Vera Institute of Justice (Shirley 2019) claims that offenders who take part in college education programmes are 43% less likely to reoffend following release, and that prisons who offer these programmes report fewer incidents of violence.

This suggests prison may be a worthwhile experience assuming offenders are able to access these programmes.

School for crime

Another limitation of custodial sentencing is offenders may learn to become better offenders.

Alongside the legitimate skills that offenders may acquire during their time in prison, they may also undergo a more dubious 'education' as part of their sentence. Incarceration with long-term offenders may give younger inmates in particular the opportunity to learn the 'tricks of the trade' from more experienced prisoners. Offenders may also acquire criminal contacts whilst in prison that they may follow up when they are released.

This form of 'education' may undermine attempts to rehabilitate prisoners and consequently may make reoffending more likely.

Evaluation eXtra

The purpose of prison

A recent survey (Onepoll 2015) found that nearly half of the respondents (47%) saw the primary purpose of prison as being to punish the offender for their wrongdoing. Many saw current prison regimes as 'too soft', akin to a 'holiday camp' that would not deter existing or would-be offenders.

However, a similar number of respondents (40%) held the view that prison's main emphasis should be on reform and rehabilitation, that prison should provide access to training and treatment so that offenders can be effectively reintegrated back into society. Overcrowding and lack of funding were seen as barriers to these.

Consider: *Should the purpose of prison be to punish or rehabilitate?*



The prison system has been likened to a 'revolving door' because of recidivism.

Apply it Methods

Comparing recidivism rates

The inmates at Badchaps Prison receive compulsory education, training and anger management as part of their prison sentence. In contrast, Nortilads Prison, in the neighbouring town has funding problems, is overcrowded and does not provide any such opportunities for its inmates.

Out of 150 prisoners released from Badchaps in 2012, 48 had reoffended within three years. Out of 150 released from Nortilads in the same year, 87 were back 'inside' within three years.

Questions

1. What percentage of the prisoners released from Badchaps had reoffended within three years? Show your calculations. (*2 marks*)
2. What percentage of the prisoners released from Nortilads had reoffended within three years? Show your calculations. (*2 marks*)
3. Sketch an appropriate graphical display to show the percentage of prisoners released from Badchaps and Nortilads who reoffended over the three-year period. (*4 marks*)
4. Identify and explain *one* **sampling technique** that could have been used to select offenders in the investigation above. (*3 marks*)
5. Evaluate the sampling technique you identified in question 4 with reference to the investigation above. (*4 marks*)

Apply it Concepts

The Stanford Prison experiment

The classic illustration of the psychological effects of the prison environment is Philip Zimbardo's Stanford Prison experiment (1973), which was described in our Year 1 book. The study demonstrated how quickly 'prisoners' conformed to the role they had been assigned, becoming helpless and apathetic in the process. Prisoners (and prison guards) experienced de-individuation – a loss of identity and self-awareness as the experimental role overtook them.

Questions

1. How does the Zimbardo study illustrate the possible psychological effects of prison?
2. How might the criticisms of Zimbardo's research (artificiality, **validity**, etc.) undermine its contribution to a discussion of the psychological effects of prison?

Check it

1. Briefly discuss recidivism in relation to **two** of the aims of custodial sentencing. *[8 marks]*
2. Outline **one or more** aims of custodial sentencing as a way of dealing with offending behaviour. *[6 marks]*
3. Outline **two** psychological effects of custodial sentencing. *[4 marks]*
4. Discuss the aims **and** psychological effects of custodial sentencing. *[16 marks]*

Dealing with offending behaviour: Behaviour modification in custody

The specification says...

Dealing with offending behaviour: behaviour modification in custody.

Behaviour modification is one of several schemes that may form part of the custodial sentence – another is anger management, which we will turn to shortly. The aim of these programmes is to effectively manage and monitor offenders during their sentence, as well as reduce the likelihood that they will reoffend after they are released.

Behaviour modification – or as it is more commonly called in its applied form, token economy – uses systems of reward and punishment to encourage obedience and avoidance of conflict in prison inmates.

Key term

Behaviour modification An application of the behaviourist approach to treatment (such as the management of offenders in penal institutions). It is based on the principles of operant conditioning. The general aim is to replace undesirable behaviours with more desirable ones through the selective use of positive and/or negative reinforcement (as in token economies).



As part of a behaviour modification programme, prisoners who 'toe the line' may be entitled to a reward, such as use of a computer suite.

Behaviour modification in custody

Behaviourist principles

According to the **behaviourist approach** all human behaviour is learned. In which case it should be possible to encourage the *unlearning* of behaviour. **Behaviour modification** programmes are designed with the aim of reinforcing obedient behaviour in offenders, whilst punishing disobedience, in the hope that the former continues and the latter dies out (becomes extinct).

Token economy

Behaviour modification programmes, such as **token economies**, are based on **operant conditioning**. Within the walls of a prison, desirable behaviour may include avoiding confrontation, following prison rules, keeping one's cell orderly, and so on. In a token economy, prisoners are given a token each time they perform a desirable behaviour.

Each of these behaviours and rewards would be made clear to the prisoners before the programme is implemented. It would also be emphasised that non-compliance, or disobedience, may result in the tokens (and the associated privileges) being withheld or removed (a form of **punishment**).

Tokens are not rewarding in themselves but derive their value from their association with a reward and thus are called **secondary reinforcers**. In a prison the tokens might be exchanged for a phone call to a loved one, time in the gym or exercise yard, extra cigarettes or food (all of which are **primary reinforcers** i.e. they are directly rewarding).

Designing and using a token economy

Operationalise target behaviours In a token economy, a target behaviour is **operationalised** by breaking it down into component parts. For instance, the target behaviour may be improved interaction with other prison inmates. This may be broken down into not touching another prisoner as you pass them, speaking politely to others, etc. These 'units' of behaviour should be objective and measurable and agreed with prison staff and inmates in advance.

Scoring system Staff and prisoners should also be made aware of the scoring system and how much each particular behaviour is 'worth'. Behaviours are hierarchical in the sense that some are regarded as more demanding than others so receive greater rewards. In the context of the example above (improving interactions with other inmates), we might award more tokens to 'working co-operatively on a group task' than 'not swearing'. Some token economy systems may award tokens directly whereas others may award points which are then converted to tokens. In either case, the recommendation is that reinforcements should outnumber punishments by a ratio of 4:1 (Gendreau *et al.* 2011).

Train staff It is important that prison staff are given full training in order to implement the token economy system successfully. Training may involve several hours for a number of weeks. The aim is to **standardise** the procedures so that all prison staff are rewarding the same behaviours in the same way. Staff must also record when they have awarded tokens so the progress of individual prisoners can be assessed.

Apply it Concepts – Token economy – you make the rules

Imagine you are a prison superintendent with responsibility for the effective management of offenders.

Questions

1. Make a list of all the behaviours you would consider to be good or desirable and would be positively reinforced within your token economy system.
2. Which of the behaviours you have listed do you think would be most resistant to change? Why?

Apply it Concepts – Long-term effects

Although it seems to be the case that behaviour modification may produce short-term effects (an increase in compliant behaviour within institutions), its long-term effectiveness is less certain. Harold Cohen and James Filipczak (1971) demonstrated how a token economy group showed more desirable behaviour than a control group within an adult prison. Even though the researchers noted that those offenders who took part in the programme were less likely to have reoffended two years later – after three years, rates of recidivism went back to reflecting national statistics.

This suggests that whilst behaviour modification may *delay* recidivism, it has little overall impact in the longer term.

Question

Using the evaluation points (facing page), explain why the benefits of behaviour modification may not generalise beyond the prison setting.

Evaluation

Research support

One strength of behaviour modification is that it has evidence to support it.

Tom Hobbs and Michael Holt (1976) introduced a token economy programme with groups of young offenders across three behavioural units (and a fourth unit acted as a 'control'). They observed a **significant** difference in positive behaviour compared to the non-token economy group. Further, Clinton Field *et al.* (2004) found a token economy programme used with young people with behavioural problems was generally effective, although there were still a number of young people who did not respond. Later these youths were placed on a special programme where the rewards were more immediate and more frequent and the results were more positive.

This suggests that token economy systems do work.

Counterpoint However, the success of such systems does depend on a consistent approach from prison staff. John Bassett and Edward Blanchard (1977) found any benefits were lost if staff applied the techniques inconsistently. According to the researchers, this was due to factors such as lack of appropriate staff training or high staff turnover (the latter, particularly, is a feature of many UK prisons).

This suggests that behaviour modification schemes must ensure full and consistent staff participation if they are to work.

Easy to implement

Another strength of behaviour modification is that it is relatively straightforward to set up in custody.

The appeal of behaviour modification (e.g. token economies) rests largely upon the ease with which it can be administered. There is no need for a specialist professional to be involved as there would be for other forms of treatment such as **anger management** (see next spread). Rather, token economy systems can be designed and implemented by virtually anyone in any institution. They are also cost-effective and easy to follow once workable methods of reinforcement have been established.

This suggests that behaviour modification techniques can be established in most prisons and accessed by most prisoners.

Little rehabilitative value

One limitation of behaviour modification is that it may not affect long-term behaviour.

In the words of Ronald Blackburn (1993), behaviour modification has 'little rehabilitative value' and any positive changes in behaviour that may occur whilst an offender is in prison may quickly be lost when they are released. More cognitive-based treatments, such as anger management, may be more likely to lead to permanent behavioural change. Such treatments require the offender to understand the cause of their offending and to take responsibility for their own rehabilitation. In contrast, offenders can fairly easily play along with a token economy system in order to access the rewards, but this produces little change in their overall character.

This may explain why, once the token economy is discontinued, an offender may quickly regress back to their former behaviour.

Evaluation eXtra

Ethical issues

Behaviour modification programmes have been associated with decreased conflict within penal institutions and more successful management of the prison population. This can reduce pressure and stress on prison staff in what can be a hostile and difficult environment.

However, critics have described behaviour modification as manipulative and dehumanising (Moya and Achtenberg 1974). Participation in the scheme is obligatory rather than optional, and human rights campaigners argue that withdrawal of 'privileges', such as exercise and contact with loved ones (in the form of withdrawal of tokens), is unethical.

Consider: *Do the potential benefits of behaviour modification outweigh the ethical objections?*



In a behaviour modification programme, prisoners exchange tokens for rewards.

Apply it Concepts

The 'reward' of a conjugal visit

A conjugal visit is a scheduled period in which a prison inmate is permitted to spend several hours in private with a visitor, usually his or her legal spouse. The parties may engage in sexual intercourse.

The basis for allowing such visits is to preserve family bonds and increase the chances of success for a prisoner's eventual return to life after release from prison.

Conjugal visits are not currently permitted in UK prisons, however they are permitted in many other countries, including America (they were allowed in 23 states but this has now decreased to just six).

Although controversial, research in America suggests that conjugal visits may reduce incidences of sexual and physical violence in prisons within the states that allow them (D'Alessio *et al.* 2012).

Question

Explain how a conjugal visit may form part of a behaviour modification programme in prison.

Apply it Methods

Young offenders' institute

A young offenders' institute introduced a token economy system for a period of six weeks. At the beginning of the programme, each young offender was given a rating (out of 50) based on a questionnaire completed by prison staff. The questionnaire included several measures of the offender's behaviour in prison including level of compliance when dealing with prison staff and relationship with other offenders. At the end of the programme, the young offenders were rated again using the same questionnaire.

Questions

1. Write a suitable **hypothesis** for the investigation above. (*2 marks*)
2. Which **experimental design** has been used in the investigation above? (*1 mark*)
3. Explain why this experimental design was most suitable for the investigation above. (*3 marks*)
4. Which **statistical test** would be most appropriate for analysing the difference in offender ratings before and after the programme? Justify your answer with reference to **levels of measurement**. (*3 marks*)

Check it

1. Explain what is meant by 'behaviour modification'. *[2 marks]*
2. Describe how a behaviour modification programme might be put into place in a prison. *[4 marks]*
3. Explain **one** criticism of behaviour modification as a way of dealing with offending behaviour. *[4 marks]*
4. Discuss behaviour modification in custody. *[16 marks]*

Dealing with offending behaviour: Anger management

The specification says...

Dealing with offending behaviour: anger management.

Unlike behaviour modification (previous spread), anger management has the advantage that treatment can be administered outside of the institutional setting as well as inside. The focus of anger management is different too – it concentrates on the cognitive factors that may influence offending behaviour.

Key term

Anger management A therapeutic programme that involves identifying the signs that trigger anger as well as learning techniques to calm down and deal with the situation in a positive way. The aim of anger management is not to prevent anger but to recognise it and manage it. Anger management can be offered in prison to encourage self-awareness and facilitate rehabilitation.

Study tip

Students often have difficulty remembering the names of the three stages in anger management:

Cognitive Preparation; Skills Acquisition; Application Practice.

This mnemonic may help:

Calm People Should Avoid Angry People.



Perhaps she ordered a red phone . . . a possible candidate for anger management.

Anger management

Cognitive behaviour therapy

Raymond Novaco (1975) suggests that **cognitive** factors trigger the emotional arousal which generally precedes aggressive acts. His argument is that, in some people, anger is often quick to surface especially in situations that are perceived to be anxiety-inducing or threatening.

In **behaviourist** terms, becoming angry is **reinforced** by the individual's feeling of control in that situation. As such, **anger management** programmes are a form of **cognitive behaviour therapy** (CBT) – the individual is taught how to recognise the cognitive factors that trigger their anger and loss of control, and then encouraged to develop techniques which bring about conflict resolution without the need for violence.

Three stages

1. **Cognitive preparation** This stage requires an offender to reflect on past experience and consider the typical pattern of their anger. The offender learns to identify those situations which act as triggers to anger and, if the way in which the offender interprets the event is irrational, the therapist's role is to make this clear. For instance, the offender may view someone looking at them or their partner as an act of confrontation. In redefining the situation as non-threatening, the therapist is attempting to break what may well be an automatic response for the offender.
2. **Skills acquisition** In this stage offenders are introduced to a range of techniques and skills to help them deal with anger-provoking situations more rationally and effectively. Techniques may include:
   - Cognitive – positive self-talk to encourage calmness, for example, we are all familiar with the idea of counting to ten to temper our reaction to a stressful event.
   - Behavioural – assertiveness training in how to communicate more effectively which will become an automatic response if practised regularly.
   - Physiological – deal with the physical reaction to anger such as using relaxation training or meditation. The aim is to control one's emotions rather than being controlled by them.
3. **Application practice** In the final phase, offenders are given the opportunity to practise their skills within a carefully controlled environment. Such **role play** is likely to involve the offender and the therapist re-enacting scenarios that may have escalated feelings of anger and acts of violence in the past. This requires a certain amount of commitment from the offender – they must see each scenario as real. It also requires a certain amount of bravery from the therapist whose job it is to 'wind up' the offender in order to assess their progress! If the offender deals successfully with the role play this is given **positive reinforcement** by the therapist.

Positive outcome with young offenders

Julia Keen *et al.* (2000) has studied the progress made with young offenders aged between 17 and 21 who took part in a nationally recognised anger management programme. First devised in 1992 and updated in 1995, the *National Anger Management Package* was developed by the England and Wales Prison Service. The course comprises eight two-hour sessions, the first seven over a three-week period with the last session a month afterwards, and the content broadly follows what is described above.

Although there were initial issues in terms of offenders not taking the course seriously, and individuals forgetting routines such as the requirement to bring their diary, the final outcomes were generally positive. Offenders reported increased awareness of their anger management difficulties and an increased capacity to exercise self-control.

Apply it Concepts

Anger management – does it work?

Jane Ireland (2004) compared the progress of two groups of offenders: one of which took part in an anger management programme (adapted from the *National Anger Management Package*) and the other, a non-treatment control. After the treatment group had completed 12 sessions, outcomes were assessed using three measures: an interview, a behaviour checklist completed by prison officers and a self-report questionnaire. The researchers found that 92% of the experimental group showed an improvement on at least one measure, 48% showed an improvement on the checklist and the self-report. There were no such improvements within the control group.

Question

In terms of the effectiveness of anger management programmes, what does this study (and the study by Keen *et al.* in the text above) suggest?

Evaluation

Better than behaviour modification

One strength of anger management is that the benefits may outlast those of behaviour modification.

Unlike behaviour modification, anger management tries to tackle one of the causes of offending – that is, the cognitive processes that trigger anger, and ultimately, offending behaviour. Alternative treatments such as behaviour modification deal with only surface behaviour and not the processes that drive such behaviour. Experience of anger management may give offenders new insight into the cause of their criminality and allow them to self-discover ways of managing themselves outside of the prison setting.

This suggests that anger management is more likely than behaviour modification to lead to permanent behavioural change.

Counterpoint However, follow-up studies of anger management tend not to support this assumption. The general trend is summarised by Ronald Blackburn (1993) who points out that, whilst anger management may have a noticeable effect on the conduct of offenders in the short term, there is very little evidence that it reduces **recidivism** in the long term. This may be because the application phase of treatment still relies on role play which might not properly reflect all the possible triggers that are present in a real-world situation. Any progress made in therapy may count for little when compared to, say, a busy city centre pub on a Saturday night.

This suggests that, in the end, anger management may not reduce reoffending.

Individual differences

One limitation of anger management is that success may depend on individual factors.

A study by Kevin Howells *et al.* (2005) conducted an investigation with Australian offenders. The researchers found that participation in an anger management programme had little overall impact when compared to a **control group** who received no treatment. However, this was not true for all offenders in the treatment programme. Significant progress was made with those offenders who had showed intense levels of anger before the programme. Also, offenders who were open to change and highly motivated from the outset (so-called 'treatment readiness') experienced similar gains.

This suggests that anger management may only benefit offenders who fit a certain profile.

Expensive

A further limitation of anger management is that it is likely to be an expensive option.

Anger management programmes are expensive to run as they require the services of highly-trained specialists who are used to dealing with violent offenders. For this reason, many prisons may not have the resources to fund such programmes. In addition, the success of anger management is often based on the commitment of those who participate, and this may be a problem if prisoners are uncooperative and apathetic. Change takes time and this is ultimately likely to add to the expense of delivering effective programmes.

This suggests that effective anger management programmes are probably not going to work in most prisons.

Evaluation eXtra

Anger and offending

The anger management approach suggests there is a straightforward causal relationship between anger and offending. Anger is assumed to be an important antecedent to offending in that it produces the emotional state necessary to commit crime.

However, this assumption may be false. Wagdy Loza and Amel Loza-Fanous (1999) found no differences in levels of anger between offenders classed as violent and those classed as non-violent. Further, they suggested anger management programmes may be misguided as they provide offenders with a justification for their behaviour.

Consider: *Is anger management relevant to reducing offending?*

Apply it Methods

Comparing anger management and behaviour modification

At Badchaps Prison, researchers wanted to see whether anger management or behaviour modification led to more positive changes in behaviour. The prison population were randomly allocated into one of three groups:

- Group 1 received six months of behaviour modification.
- Group 2 received six months of anger management.
- Group 3 received no treatment.

At the beginning and end of the investigation, all prisoners were assessed to see if there was a positive change in their behaviour.

Questions

1. Explain the purpose of Group 3 in the investigation above. (*3 marks*)
2. Explain how prisoners might have been **randomly allocated** to one of the three groups and why this would have been necessary. (*4 marks*)
3. Identify and explain *one* **ethical issue** in the investigation above. (*3 marks*)



Offenders attempt to pinpoint what triggers their anger during an anger management session.

Apply it Concepts

'Big Terry'

Terry is serving a six-month sentence for a violent assault. Terry repeatedly punched a man who had caused him to spill a drink after bumping into him at a busy bar. Known to friends as 'Big Terry', he has served time for similar incidents in the past. Terry has also hit his wife on two occasions – he says, 'when she nags me, I see red'. Terry has agreed to undertake a course of anger management during his prison sentence.

Questions

1. Explain the stages involved in anger management. Refer to Terry in your answer.
2. Using evidence, consider how likely it is that Terry will be able to control his anger in future.

Check it

1. Outline anger management as a way of dealing with offending behaviour. *[6 marks]*
2. Explain what research has shown about anger management as a way of dealing with offending behaviour. *[4 marks]*
3. Explain **one** strength of anger management as a way of dealing with offending behaviour. *[4 marks]*
4. Discuss the use of anger management as a way of dealing with offending behaviour. *[16 marks]*

Dealing with offending behaviour: Restorative justice

The specification says...

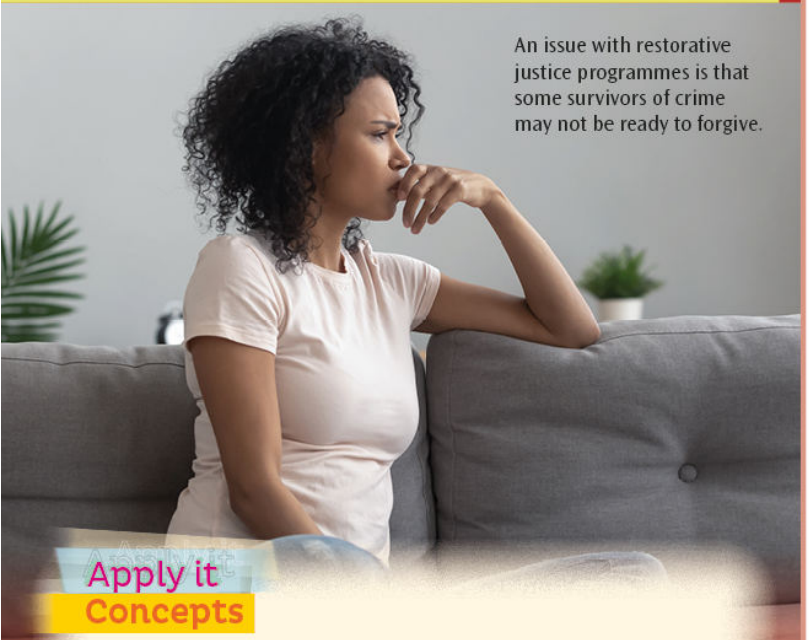
Dealing with offending behaviour: restorative justice programmes.

Restorative justice typically involves offenders coming face-to-face with the person(s) they have offended against – the victims. Clearly this may be sensitive and needs to be carefully managed but, if done properly, restorative justice can be a crucial stage in an offender's rehabilitation, and perhaps more importantly, it may help a victim put the incident behind them and move on.

Here, we examine the case for restorative justice as well as some of the key issues involved in it. We also return to the problem of recidivism and consider the best way forward in terms of reducing rates of reoffending.

Key term

Restorative justice A system for dealing with offending behaviour which focuses on the rehabilitation of offenders through reconciliation with victims (survivors). This enables an offender to see the impact of their crime and serves to empower survivors by giving them a 'voice'.



An issue with restorative justice programmes is that some survivors of crime may not be ready to forgive.

Apply it
Concepts

Ways of dealing with offenders

On this spread and the previous three spreads you have learned about a number of methods used to deal with offenders: custodial sentencing, behaviour modification, anger management and restorative justice. These different methods are often used in conjunction with each other, for example someone given a custodial sentence may also take part in a behaviour modification programme or anger management therapy. Ultimately such methods are judged in terms of recidivism.

Question

For each of the four methods you have studied for dealing with offending behaviour, explain the impact you feel it is likely to have on recidivism.

Restorative justice programmes

The basic principles of **restorative justice** are not new (indeed the idea of offenders 'paying back' their victims in some form is thousands of years old).

Changing the emphasis

Historically, a person convicted of a criminal offence would have been regarded as having committed a crime against the state. In contrast, restorative justice programmes switch the emphasis from the needs of the state (to enforce the law and punish) to the needs of the individual victim (to feel compensated in some way and come to terms with the crime).

In doing this the method of treatment seeks to be a healing process, as John Braithwaite (2004) suggests, 'crime hurts, justice should heal'. Restorative justice is less about 'retribution' (i.e. punishing the offender) and more about 'reparation' (repairing the harm they have caused).

The aims set out above mean that restorative justice seeks to focus on two things:

- The victim (or survivor) of the crime and their recovery. (The term 'survivor' is preferred.)
- The offender and their recovery/rehabilitation process.

Key features of the programme

Restorative justice programmes can be quite diverse but most share key features:

- Trained mediator supervises the meeting.
- Non-courtroom setting where offenders voluntarily meet with survivor(s).
- Can be a face-to-face meeting or conducted remotely via video link.
- The survivor is given the opportunity to confront the offender and explain how the incident affected them. This enables the offender to comprehend the consequences of their actions, including the emotional distress it caused.
- It is important that there is active rather than passive involvement of all parties in the process wherever possible.
- The focus is on positive outcomes for both survivors and offenders.
- In addition, other relevant community members may have a role in the process, such as neighbours, friends, family members. They may all wish to explain the effects of the crime.

Sentencing and restitution

Restorative justice may occur pre-trial (and the offender's involvement may be considered during sentencing). It could also function alongside a prison sentence, or as an alternative to prison (especially if the offender is young) or as an incentive to reduce the length of a sentence.

In its traditional sense, restitution is often seen as a monetary payment by an offender to the survivor for the harm resulting from the offence. Therefore, an offender may make some financial restitution to the survivor which may reflect the psychological damage caused or the actual physical damage, in the case of a break-in for instance. Other variations of the scheme may involve the offender repairing damaged property themselves.

However, the idea of restitution, or paying back, can also be in a more emotional sense. The offender can support the healing process by repairing and rebuilding the survivor's confidence or self-esteem.

Restorative Justice Council

The Restorative Justice Council (RJC) is an independent body whose role is to establish clear standards for the use of restorative justice (or restorative practice as the RJC refers to it) and to support survivors and specialist professionals in the field.

The RJC advocates the use of restorative practice beyond dealing with crime. It can be used in preventing and managing conflict in many areas including schools, children's services, workplaces, hospitals and communities.

Evaluation

Needs of the survivor

One strength of restorative justice is that evidence suggests it has positive outcomes.

The Restorative Justice Council (Shapland *et al.* 2008) reported the results of a major seven-year research project. The headline figures are impressive: 85% of survivors reported satisfaction with the process of meeting their offender face-to-face and 78% would recommend it to other people experiencing a similar situation. About 60% of survivors felt the process had made them feel better about the incident – enabling them to feel closure and to 'move on'. Only 2% said it had made them feel worse.

This suggests that restorative justice achieves some of its aims, helping survivors of crime cope with the aftermath of the incident.

Counterpoint Not all research is overwhelmingly positive. William Wood and Masahiro Suzuki (2016) argue that restorative processes are not as survivor-focused as often reported in satisfaction surveys. Indeed, the researchers say that restorative justice processes can become distorted, such as when survivors of crime are 'used' as a way of helping to rehabilitate offenders, rather than being helped themselves.

This suggests that the needs of the survivor in restorative justice may be seen as secondary to the need to rehabilitate offenders.

Recidivism

A further strength is that restorative justice does seem to lead to a decrease in rates of reoffending (**recidivism**).

A **meta-analysis** of ten studies by Heather Strang *et al.* (2013) compared offenders who experienced face-to-face restorative justice schemes with those who just experienced custodial sentencing. The restorative justice group was **significantly** less likely to reoffend. This reduction was larger in offenders convicted of violent crime than crimes against property. Similarly, a review of 24 published studies by Kristin Bain (2012) found lowered recidivism rates with adult offenders, especially when using one-to-one contact rather than general community involvement.

This suggests that restorative justice has a positive impact on reoffending, maybe more so for some types of offence than others and some approaches.

Abusing the system

One limitation of restorative justice is that offenders may abuse the system.

The success of restorative justice programmes may hinge on an offender's intentions being honourable – that is, they must be taking part because they genuinely regret the hurt caused and they want to make amends. However, Hubert Van Gijseghem (2003) suggests that offenders may use restorative justice for all kinds of reasons: avoiding punishment, playing down their faults, even taking pride in their relationship with the survivor using direct contact (face-to-face or in writing).

This would explain why not all offenders ultimately benefit from restorative justice and go on to reoffend.

Evaluation eXtra

Domestic violence

Whilst restorative justice is permitted in cases of domestic violence, the National Police Chief's Council (NPCC) policy does not support its use in this context. Marian Liebman (2016) argues that the main concern is that the power imbalance between abuser and abused puts pressure on survivors, who may fear the worst if they do not go along with their partner or ex-partner's suggestions during mediation.

However, others argue that pre-trial mediation in domestic violence cases produces positive results for survivors (Lünnemann and Wolthuis 2015). Robin Sen *et al.* (2018) suggest that restorative approaches are particularly useful in cases of intimate partner violence where a couple has chosen to remain together, as they can address the harm caused and plan for the future.

Consider: *Should restorative justice be used with all types of crime?*



Apply it Methods — Restorative justice – does it work?

Empirical studies of the effectiveness of restorative justice are rare but there are some. The most significant study of recent times was conducted by Lawrence Sherman and Heather Strang (2007) who compared 36 studies of restorative justice with conventional justice such as prison.

The researchers found reductions in reoffending rates for violent and property crimes particularly. For victims, incidents of post-traumatic stress disorder were significantly reduced and all parties reported greater satisfaction with the overall process than for conventional justice. This suggests that restorative justice may have positive outcomes for victims and offenders.

Questions

1. Sherman and Strang's study is an example of **meta-analysis**. Outline what is meant by a meta-analysis. *(2 marks)*
2. Explain the strengths and limitations of conducting a meta-analysis. Refer to Sherman and Strang's study in your answer. *(6 marks)*
3. Design a study to investigate the difference in recidivism rates between offenders who experience a restorative justice scheme and those who experience custodial sentencing. Include details of the sample, design, variables, controls and how the data would be analysed. *(12 marks)*

Apply it Concepts — Maria

Maria's flat was burgled whilst she was asleep in bed. Although police caught the burglar and most of her possessions were recovered, Maria has had difficulty sleeping ever since and has difficulty concentrating at work during the day. The police have asked Maria if she would like to take part in a restorative justice programme with the man who burgled her flat. Maria is thinking it over.

Questions

1. Outline possible features of Maria's restorative justice programme.
2. Consider how effective restorative justice programmes are. Refer to the experience of Maria in your answer.

Check it

1. Explain what is meant by 'restorative justice'. *[2 marks]*
2. Outline how restorative justice has been used to deal with offending behaviour. *[6 marks]*
3. Explain **one** strength of restorative justice programmes as a way to deal with offending behaviour. *[4 marks]*
4. Discuss restorative justice as a way of dealing with offending behaviour. *[16 marks]*

Practical corner

The specification says...

> Knowledge and understanding of...research methods, practical research skills and maths skills. These should be developed through...ethical practical research activities.

Two practical activities have been designed to support your understanding of the forensic psychology module. The first one concerns a correlation between risk-taking and extraversion (as Eysenck's theory of the criminal personality would predict). The second looks at the facial characteristics associated with the atavistic form.

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?



Practical idea 1: Extraversion and risk-taking

The aim of this study is to investigate whether, following Eysenck, there is a relationship between personality, (**extraversion**) and risk-taking.

More specifically, will there be a **correlation** between participants' scores on an extraversion scale and the likelihood that participants will make a risky decision when faced with a hypothetical scenario.

The practical bit

Eysenck's theory (see page 330) suggests that extraverts – outgoing, sociable, energetic people – have an underactive nervous system, which means they are more likely to take risks. They also happen to be more likely to commit crime but it might be better not to disclose this to your participants, particularly the extravert ones!

Measuring riskiness

We can investigate 'riskiness' indirectly by presenting participants with the following dilemma:

> *You have a modestly-paid but secure job. Your income is unlikely to increase before you retire. You have recently been offered a much better paid job with a new company with an uncertain future. There is a possibility of a share in the ownership if the company does well.*
>
> *What would be the lowest probability of the company doing well that you would accept before taking the job? Write your answer as a percentage.* (Adapted from *Choice Dilemmas Questionnaire* – Kogan and Wallach 1964)

In this scenario, the lower the percentage, the riskier the decision. Taking the job with a 20% **probability** that the company may survive would constitute a much riskier decision than an 80% probability. For this reason – if Eysenck's theory is correct – we would expect to find a **negative correlation** between risk percentage and extraversion scores.

Measuring extraversion

There are many online **questionnaires** which are variations of the **EPQ** (described on page 330) or the EPI, an earlier version of the EPQ. Both will provide an extraversion score.

Choosing your sample

You will need to consider a suitable **sampling technique** for this investigation. It might be wise to stay clear of A level Psychology students as they might be aware of the connection between extraversion and other behaviours so this may influence the answers they give. You need to decide how you will explain the study aims so participants are not affected by **demand characteristics**. It is important to reassure your participants that all the data you receive will be treated **confidentially**.

Displaying and analysing your results

Once you have collected your raw data, you need to represent this using an appropriate graph. This should give you an immediate insight into whether there is a relationship between the two variables. You should also analyse your results using one of the **statistical tests** described on page 70.

Apply it Methods

The maths bit 1

Table 1 Risk percentage and extraversion scores.

Participant	Risk percentage	Extraversion score
1	20	56
2	75	36
3	90	25
4	50	51
5	25	82
6	35	70
7	60	54
8	80	44
9	45	65
10	35	31

1. Write an appropriate **hypothesis** for the investigation above. (*2 marks*)
2. Which graphical display would be most appropriate to represent the relationship between risk percentage and extraversion score in Table 1? Explain your answer. (*2 marks*)
3. Sketch the graphical display you have identified in question 2 using the data in Table 1. Comment on the relationship shown on the graph. (*4 marks*)
4. Which **statistical test** would be most appropriate to analyse the relationship between risk percentage and extraversion score in Table 1? Explain *two* reasons for your choice of test. (*3 marks*)
5. Work out the **calculated value** for the data in Table 1. Explain how you would determine whether the result you have obtained is **significant**. (*3 marks*)
6. Explain *one* strength and *one* limitation of **correlational research**. Refer to this investigation in your answer. (*6 marks*)

Practical idea 2: Investigating the atavistic form

The aim of this study is to see if people associate particular facial features with offending.

Following Cesare Lombroso (page 326), will an individual with an **atavistic** face be seen by participants as more likely to have committed crime than a person with a 'neutral' face?

The practical bit

Your task here is to conduct an **experiment** based on Lombroso's theory of the atavistic form. You will need to gather a sufficient number of participants to create two **independent groups**. Each group will be shown a different picture of a face – one face has a number of features that Lombroso identified as atavistic. The other, a more 'neutral' face, should not include any of these characteristics. All participants will then have to rate the person they see in the picture in terms of how likely they are to have a criminal record (see below).

Creating the materials

A well-designed experiment will use the same face for both conditions – in one condition the face will have atavistic features (A) and in the other condition the face will have no atavistic features i.e. neutral (N). The set of photographs shown to Group 1 should have a mix of A and N pictures and Group 2 has the others – you do this by taking your first pair of pictures and the A picture goes to Group 1 and the N picture to Group 2. With the second pair the N picture goes to Group 1 and the A picture to Group 2. Alternatively you can do this by **random allocation**.

This will control for **confounding variables** because the faces are the same for all participants – the only change is atavistic features (the **independent variable**).

You can create your A and N pictures in one of two ways. You can use free face creator apps (such as FlashFace) and produce pairs of the same face – one with atavistic features (e.g. narrow brow, prominent jaw, facial asymmetry) and the other with no atavistic features.

Alternatively you can take photographs of friends and ask them to do one neutral pose and one where their face looks more atavistic (e.g. slightly asymmetric). Again allocate the photographs to participant groups so there is a mix.

Standardised procedure

You will need to approach your potential participants with a briefing statement. This should be written and read out so everyone receives the same information. You should introduce yourself and the aim of the investigation (without giving the game away) and make sure you observe all relevant **ethical issues** (see 'Ethics check' on facing page). Participants should be asked to rate the person in the picture (let's say, out of 10) in terms of how likely they are to have a criminal record. The following statement would do the job:

> *Study the person in the picture you have been presented with. How likely, on a scale of 1 to 10, would you say it is that the person in the picture has a criminal record? A rating of 1 suggests you think they definitely do not have a criminal record, a rating of 10 suggests you definitely think they do.*

Once you have recorded their rating, you must **debrief** each participant using a standard statement. Remember, again, to ensure that all ethical issues have been properly addressed.

Analysing data

Once you have collected your data, don't forget to summarise it using appropriate graphs and tables (example on right). Although there may be a difference in terms of median ratings, you might want to examine whether the difference is **significant** by employing the correct statistical test. Remember, when comparing your calculated value with the **critical value** you need to know whether the test is **one-tailed** or **two-tailed** as well as the appropriate **level of significance**.





Which is the criminal face?

The maths bit

Overall, at least 10% of the marks in assessments for Psychology will require the use of mathematical skills and this is included in the requirement that at least 25–30% in total will involve research methods.

Apply it Methods

The maths bit 2

1. Why are **measures of dispersion** calculated as well as measures of central tendency? Refer to Table 2 in your answer. (*2 marks*)
2. Identify *one* possible **confounding variable** in the investigation described. Explain why this variable would need to be controlled and how it would be controlled. (*3 marks*)
3. Explain *one* conclusion that can be drawn from the data in Table 2. (*2 marks*)
4. Suggest an appropriate **alternative hypothesis** and a **null hypothesis** for the investigation described. (*4 marks*)
5. Explain *one* problem with the use of **ordinal rating scales** – like the one in the investigation described – for measuring participants' attitudes towards an atavistic or neutral face. (*3 marks*)

Table 2 Median and range values for ratings for atavistic and neutral face.

	Atavistic face	Neutral face
Median rating	7	2.5
Range	2	3

Revision summaries

Offender profiling

The top-down approach

US model of profiling.

The theory

Offender profiling
Narrow the list of suspects and generate hypotheses about the likely offender.

The American approach
FBI interviews with 36 murderers. Data from crime scene matched to category and then predicts other characteristics.

Organised and disorganised offenders
Organised = targets victim, high IQ, skilled job, high control, married.
Disorganised = little planning, impulsive, low IQ, unskilled job, failed relationships.

Constructing an FBI profile
(1) Data assimilation, (2) crime scene classification, (3) crime reconstruction, (4) profile generation.

Evaluation

Research support
100 serial killings (smallest space analysis) supported organised category (Canter *et al.*).

Counterpoint – most killers have multiple contrasting characteristics, don't fit into one 'type' (Godwin).

Wider application
Applied to burglary, 85% rise in solved cases in US (Meketa).

Flawed evidence
Interview sample small, not random, similar kinds of offender, non-standard questions (Canter *et al.*).

Evaluation extra: Personality
Top-down profiling is based on behavioural consistency, however situational factors may matter more (Mischel).

The bottom-up approach

UK approaches to profiling.

The theory

Profile emerges from analysis of the crime scene.

Investigative psychology
Interpersonal coherence – crime scene behaviour reflects everyday behaviour.
Time and place – dwelling place.
Forensic awareness – previous crimes.

Geographical profiling
Crime mapping based on spatial consistency, may reveal offender's 'centre of gravity' (circle theory) and marauder or commuter (Canter and Larkin).

Evaluation

Evidence for investigative psychology
66 sexual assaults, smallest space analysis, consistent pattern of behaviour = case linkage (Canter and Heritage).

Counterpoint – database of solved crimes using case linkage which may have been easy to link.

Evidence for geographical profiling
120 US serial killer cases, place where bodies left created a circle of gravity, pointing to home base (Lundrigan and Canter).

Geographical information insufficient
Recording of crime inaccurate (75% of crimes not reported), age and experience matter (Ainsworth).

Mixed results
Advice 83% useful, but 3% successful capture (Copson) and chemistry students better (Kocsis *et al.*).

Eysenck's theory

A 'halfway house' between biological and psychological explanations.

The theory

Personality theory
Three dimensions: Introversion–extraversion, neuroticism–stability, psychoticism–sociability.

Biological basis
Extraverts (underactive nervous system), neurotics (overactive sympathetic NS), psychotics (high testosterone).

The criminal personality
High on extraversion (excitement), neuroticism (overanxious), and psychoticism (aggressive).

The role of socialisation
Criminal behaviour is developmentally immature, criminal type hard to condition, they stay antisocial.

Measuring the criminal personality
EPQ has E, N and P dimensions.

Evaluation

Research support
Prisoners high on E, N and P compared to controls (Eysenck and Eysenck).

Counterpoint – offenders high on P but not E or N (Farrington *et al.*). Cortical arousal may not differ in extraverts and introverts (Küssner).

Too simplistic
Adolescents (adolescence-limited) different from adults (life-course-persistent), personality and environment interact (Moffitt).

Cultural factors
Hispanic/African-American offenders low E (Bartol and Holanchock).

Evaluation extra: Measuring personality
EPQ is useful in studying offending, but the 'score' may not sufficiently represent the complex and dynamic traits.

Biological explanations of offending behaviour

An historical approach

A primitive subspecies.

The theory

Historical approach
Criminals are genetic throwbacks (Lombroso).

A biological approach
Offending behaviour is innate, so offender not at fault.

Atavistic form
Strong jaw, high cheekbones, asymmetric face, dark skin, unemployed.

Offender types
Murderer = bloodshot eyes, curly hair.

Lombroso's research
Examined 4000+ convicts (383 dead), 40% had atavistic form.

Evaluation

Lombroso's legacy
'Father of modern criminology' (Hollin), moved from moralistic to scientific discourse.

Counterpoint – people of African descent identified as atavistic (racist), fitting eugenic views of the time.

Contradictory evidence
3000 offenders and 3000 non-offenders, no physical differences (Goring).

Poor control
Confounding variables uncontrolled, e.g. social conditions (Hay and Forrest).

Evaluation extra: Nature or nurture?
Atavistic form inherited but other factors cause physical features (e.g. poor diet).

Genetic and neural

Modern-day biological theories.

Genetic explanations

Twin and adoption studies
33% MZ concordance rates for offending, 12% DZ (Christiansen).
Adoptees 50% risk of criminal record if biological mother had offended (Crowe).

Candidate genes
MAOA and CDH13 gene variants account for 5–10% of violent crime (Tihonen *et al.*).

Diathesis-stress model
Genes triggered by social or psychological stressor, e.g. dysfunctional environment.

Evaluation

Issues with twin evidence
MZs treated more similarly than DZs (e.g. by parents), explains higher concordance.

Support for diathesis-stress
Conviction rate in adoptees with no biological or adoptive convicted parent (13.5%), 20% (one biological), 24.5% (both adoptive and biological) (Mednick *et al.*).

Evaluation extra: Nature and nurture
Similarities between adopted children and biological parents due to genes, but also environment (e.g. late adoption).

Neural explanations

Prefrontal cortex
Less activity and 11% less grey matter in PFC of people with APD (Raine *et al.*).

Mirror neurons
When offenders asked to empathise then empathy reaction (mirror neurons).

Evaluation

Brain evidence
Link between impaired frontal lobe functioning and impulsive behaviour/inability to learn from mistakes (Kandel and Freed).

Intervening variables
Criminal parents and early neglect cause both APD and neural differences (Farrington *et al.*).

Evaluation extra: Biological determinism
Biological approach suggests no responsibility, but this goes against our justice system.

Custodial sentencing

What is prison for and does it work?

The theory

Aims of sentencing
1. Deterrence – general and individual.
2. Incapacitation – protect the public.
3. Retribution – revenge for the act.
4. Rehabilitation – e.g. treatment, life skills.

Psychological effects of sentencing
Include stress, depression, institutionalisation and prisonisation (adopting the 'inmate code').

Recidivism
UK figures = about 45% after 1 year, rates vary according to time period, age, offence and country (e.g. Norway only 20%).

Evaluation

Psychological effects
Prison is demeaning (Bartol), suicides 9 times the norm, 25% women and 15% men have psychosis (Prison Reform Trust).

Counterpoint – offenders may have had pre-existing psychological difficulties (importation).

Training and treatment
Offenders who take part in education are 43% less likely to reoffend (Shirley).

School for crime
Learn criminal acts from more experienced prisoners and acquire criminal contacts.

Evaluation extra: The purpose of prison
47% of people see the purpose of prison as punishment, 40% support a focus on reform and rehabilitation.

Psychological explanations of offending behaviour

Cognitive

What goes on in the offender's mind?

Moral reasoning

Moral development
Kohlberg higher level, more sophisticated reasoning.

Link with criminality
Offenders at pre-conventional level (avoid punishment, gain rewards), egocentric, poor empathy/perspective-taking.

Evaluation

Research support
Offenders less mature moral reasoning than non-offenders (Palmer and Hollin).

Type of offence
Crimes for financial gain (e.g. robbery), more pre-conventional reasoning than impulsive crimes (e.g. assault) (Thornton and Reid).

Evaluation extra: Thinking versus behaviour
Offenders' thinking childlike (Kohlberg), but may not predict offender behaviour.

Cognitive distortions

Errors/biases in how we explain our and others' behaviour.

Hostile attribution bias
Offenders see ambiguous facial expressions as hostile (Schönenberg and Jusyte), roots in childhood (Dodge and Frame).

Minimalisation
Deny seriousness of offence (e.g. 'supporting my family'), especially sex offenders (Barbaree).

Evaluation

Real-world application
CBT aims to reduce cognitive distortions, so reduced reoffending (e.g. Harkins *et al.*).

Type of offence
Non-contact sex offenders used more cognitive distortions (Howitt and Sheldon).

Evaluation extra: Descriptive or explanatory?
Cognitive theories describe the criminal mind but can't predict future offending behaviour.

Differential association theory

A social learning theory of offending.

The theory

Scientific basis
Set of principles to explain all types of offending (Sutherland).

Offending as a learned behaviour
Acquired from significant others.

Mathematical prediction = frequency, intensity, duration of exposure.

Learning attitudes – offending occurs if exposure to pro-crime outweigh anti-crime attitudes.

Learning techniques – e.g. house-breaking.

Socialisation in prison
Learning opportunities explain why so many prisoners go on to reoffend.

Evaluation

Shift of focus
Away from biological accounts (Lombroso) or accounts of weakness and immorality.

Counterpoint – risks stereotyping people from pro-crime backgrounds, ignores individual decision-making.

Wide reach
Can account for both working-class and 'white-collar crime'.

Difficulty testing
Concepts hard to operationalise (e.g. measure pro-crime attitudes a person is exposed to).

Evaluation extra: Nurture or nature?
A child may learn pro-crime attitudes from family, or may inherit them (genetic).

Psychodynamic

Early parental influences.

The theory

The inadequate Superego
Three types (Blackburn):
1. Weak – no identification in phallic stage.
2. Deviant – internalise offender parent.
3. Over-harsh – unconscious wish for punishment.

The role of emotion – offending behaviour is consequence of emotional demands.

Maternal deprivation
Lack of a continuous early relationship leads to affectionless psychopathy and delinquency (Bowlby).

44 juvenile thieves – 14 thieves affectionless psychopaths, 12 had maternal deprivation.

Evaluation

Research support
10 offenders had disturbances in Superego formation and a need for self-punishment (Gorata).

Counterpoint – harsher parents have children who rarely express guilt (Kochanska *et al.*).

Gender bias
Girls should have weaker Superego yet more men in prison (Hoffman).

Other factors
No link between maternal deprivation and offending (Lewis), due to other factors e.g. poverty.

Evaluation extra: Contribution
Psychodynamic approach identified importance of early development and emotion, but difficult to test.

Dealing with offending behaviour

Behaviour modification in custody

Systems of reward and punishment.

The theory

Behaviourist principles
All behaviour learned, undesirable behaviour can be unlearned.

Token economy
Operant conditioning using tokens (secondary reinforcers) associated with reward, e.g. food, gym.

Designing and using a token economy
Operationalise target behaviours – objective, measurable.

Scoring hierarchy, more rewards than punishments.

Train staff – standardise, record prisoners' progress.

Evaluation

Research support
More positive behaviours in young offenders (Hobbs and Holt), immediate, frequent and positive (Field *et al.*).

Counterpoint – benefits lost if techniques inconsistent due to e.g. poor training (Bassett and Blanchard).

Easy to implement
No specialist professionals, can be run by any prison staff (once trained), cost-effective.

Little rehabilitative value
Other treatments (e.g. anger management) more likely to lead to permanent behavioural change (Blackburn).

Evaluation extra: Ethical issues
Behaviour modification decreases stress in prisons, but manipulative and dehumanising (Moya and Achtenberg).

Anger management

Cognitive factors in offending.

The theory

Cognitive behaviour therapy
Cognitive factors trigger arousal (Novaco).

Recognise cognitive factors that lead to anger, teach skills to deal with it.

Three stages
1. **Cognitive preparation** – recognise triggers.
2. **Skills acquisition** – cognitive (self-talk), behavioural (assertiveness training), physiological (meditation).
3. **Application practice** – role play skills.

Positive outcome with young offenders
National Anger Management Package with young offenders, increased awareness of anger and self-control (Keen *et al.*).

Evaluation

Better than behaviour modification
Anger management tackles root cause (dealing with triggers), more permanent change.

Counterpoint – short-term impact good but may not help cope with real-world triggers (Blackburn).

Individual differences
No overall benefit (compared to controls), except if had high anger levels and motivation (Howells *et al.*).

Expensive
Needs highly-trained specialists, change takes time and commitment.

Evaluation extra: Anger and offending
Anger management assumes anger leads to offending, but violent/non-violent offenders don't differ in anger (Loza and Loza-Fanous).

Restorative justice

Making amends directly to the victim.

The theory

Changing the emphasis
Crime seen as against individual (not state). Healing process for offender and survivors.

Key features of the programme
Trained mediator, face-to-face or video, active involvement, may include community.

Sentencing and restitution
Pre-trial, alternative to prison or reduced sentence. Restitution can be financial (pay), practical (do repairs) or emotional.

Restorative Justice Council (RJC)
Monitors standards, supports survivors, promotes wider use for conflict (e.g. workplace, schools).

Evaluation

Needs of the survivor
85% survivors satisfied, 78% recommend, 60% felt closure, 2% felt worse (Shapland *et al.*).

Counterpoint – survivors may be used to help rehabilitate offenders (Wood and Suzuki).

Recidivism
Offenders who experienced RJ less likely to reoffend (meta-analysis, Strang *et al.*), improvement best with one-to-one contact (Bain).

Remorse
Offenders' intentions may not be honourable, e.g. use RJ to avoid punishment (Van Gijseghem).

Evaluation extra: Domestic violence
NPCC policy against use in domestic violence cases (power imbalance), but positive results (Lünnemann and Wolthuis), especially for couples staying together (Sen *et al.*).

Practice questions, answers and feedback

Question 1 Briefly explain **two** contributions that atavistic form has made to our modern understanding of crime. (*4 marks*)	
Morticia's answer *Lombroso analysed nearly 4,000 living criminals and nearly 400 dead ones and he found that 40% showed evidence of atavistic characteristics. This supported his theory of crime.* *Another contribution is that his research may have led to stereotyping and prejudice of certain people by identifying the 'typical criminal'.*	Morticia has presented evidence supporting Lombroso here, rather than addressing the question and the idea of 'contribution'. This second point could be construed as a contribution – albeit a negative one – and so would gain some limited credit.
Luke's answer *Lombroso's atavistic form theory made many contributions. One is that he made the study of crime more scientific by linking it to genes rather than wickedness.* *Another contribution is that he started off offender profiling.*	Luke has clearly outlined two contributions. However, his examples are merely identified and some further elaboration is needed – only a little.
Vladimir's answer *Lombroso moved the study of crime into a more scientific realm by conducting quite painstaking research recording features of thousands of skulls.* *It could also be argued that Lombroso's approach was a forerunner to modern offender profiling techniques. He was the first to suggest that certain types of individual may commit certain types of crime.*	Vladimir's answer is clearly more detailed. Both contributions are relevant and each is elaborated. The second point might have benefitted from an example as the two sentences are somewhat repetitive.

Question 2 When questioned by police, Max claimed he punched the man in the bar because 'he looked at me funny'. In court – defending his actions – Max told the judge that the man he punched 'wasn't even hurt that bad' and 'what was I supposed to do? I was just taking care of business'. With reference to Max above, explain what is meant by 'cognitive distortions'. (*4 marks*)	
Morticia's answer *A cognitive distortion is when the way you think is biased or changed in some way, in other words distorted. This can be used to explain why some people are offenders. For example, the hostile attribution bias is when someone sees someone else shouting and interprets this in a negative way and then gives an aggressive response.* *There is evidence that some offenders have this problem of seeing other people's behaviour in a bad light and in the end they behave criminally because they got very angry.*	A muddled answer from Morticia. The definition of cognitive distortions is weak and not effectively linked to offending behaviour. The example of hostile attribution bias conveys some basic understanding of the concept and fulfils the need to cover two distortions. There is no application to the stem here.
Luke's answer *There are two main types of cognitive distortions – hostile attribution bias and minimalisation, and both can be seen in Max's behaviour. Max shows the hostile attribution bias when he says he hit him because he looked at him funny. So the problem was that Max interpreted what was probably a perfectly innocent behaviour as being aggressive so he responded aggressively.* *Max shows minimalisation when he says 'he wasn't even hurt that bad', in other words he is downplaying the damage caused by his behaviour which means he can do bad things and then excuse it.*	Luke's answer is a good one. His definition of hostile attribution bias comes at the end of the first paragraph and is clearly linked to 'Max'. Similarly minimalisation (the second cognitive distortion) is clearly defined and linked to the appropriate part of the stem.
Vladimir's answer *In the example of Max he punched someone else because the other person looked at him funny. That is quite common in offenders that they get angry at the littlest thing and think it is OK as Max says in the quote, that he was just taking care of business.* *So to Max his behaviour seems totally reasonable and normal and this is a cognitive distortion. This is a psychological explanation for offending behaviour.*	Vladimir's first paragraph amounts to little more than a repeat of the stem. The attempted definition of cognitive distortion is also not strong.

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

Question 3 A recent review of evidence in a forensic psychology journal concluded that offender profiling is 'a waste of time'.

Discuss the view that offender profiling is 'a waste of time'. Refer to **two** methods of offender profiling in your answer. (*16 marks*)

Morticia's answer *Many people see offender profiling as a waste of time because it doesn't actually result in catching offenders. On the other hand, there is evidence that in fact it is useful. In this essay, I will first of all briefly explain offender profiling and then look at arguments for and against it.*	Morticia's preamble is not really necessary here as it doesn't demonstrate any knowledge.
There are in fact two kinds of offender profiling – bottom-up and top-down. The aim is to use a method in order to narrow down the list of suspects and generate hypotheses about the likely offender. The top-down approach originated in America especially with the FBI. A match is made between what is known about the crime and categories developed by the FBI. Organised crimes show evidence of planning, control and deliberate targeting of their victim. The offender is professional with high IQ whereas disorganised crimes are the opposite. In the bottom-up approach, which is a UK system, the profile emerges from analysis of the crime scene. Investigators look at such things as time and place.	The next paragraph is better. The descriptive account of the top-down approach is the superior one here, the bottom-up approach lacks detail. The definition of profiling would have made a better start to the sentence.
On the negative side one of the problems with the top-down approach is that it is sometimes difficult to separate organised and disorganised types of offender. Often, offenders may show behaviour associated with both types. So this is a significant limitation. Perhaps a bigger issue is that the top-down model is based on the idea that people always behave consistently, and they may not always. The evidence for the model isn't very good because the sample was poor. On the positive side, the top-down approach continues to be used in America so it must have some value and it is based on research evidence that looked at 36 killers.	This is followed by a reasonable evaluative paragraph in terms of points raised but poor in terms of explanation. Each point is relevant but rather 'list-like' in presentation. Fewer points explored in more depth would be preferable.
The bottom-up approach also has criticisms though there is probably more evidence in its favour. For example, Canter has done a number of studies that show that this approach is quite objective and scientific, and has a wide number of applications. So this is a strength of the approach and it makes it much more useful than the top-down approach. On the other hand there have been some notable failures for this approach such as the Rachel Nickell case.	A similar theme in the next paragraph. The points made lack sufficient evidence and depth to be convincing.
So on balance I would probably agree with the review in the forensic journal that the disadvantages outweigh the successes and it is a waste of time especially the top-down approach. There are many other approaches that psychologists have proposed to help with crime-solving that would work just as well. **(401 words)**	At least there is reflection on the stem of the question at the end. This answer would have benefitted from more evidence and greater depth of discussion.
Luke's answer *There are two methods of offender profiling. The American top-down system originated in the United States as a result of work carried out by the FBI in the 1970s. The FBI gathered data on 36 serial killers and used this to create types of offender, classing them as organised or disorganised. The FBI uses this classification system to make predictions about offenders. They examine a crime scene and classify it as organised or disorganised and this coupled together with aspects of the crime (such as sequence of events and type of victim) enables them to predict features of the offender such as demographic background and physical characteristics.*	A clear contrast here in Luke's answer which provides detailed, well-focused description.
The evidence is not very good for this approach so it is easy to see why it would be regarded as a waste of time. First, the type of crime it is relevant to is very limited to killers or rapists. Secondly, it assumes a model of personality that is really very outmoded – the model assumes that people belong to fixed typologies which are consistent across situations and contexts. In fact altogether the classification system is too simplistic and offenders often show organised and disorganised behaviour within the same crime scene. The original sample was only 36 killers of a certain type, so the concept might be salvageable if more offenders were studied and the typology extended.	In paragraph 2 there is a clear 'nod' to the essay stem at the beginning of this paragraph which is good. Note the higher level of discussion here compared to the previous answer from Morticia.
The UK bottom-down system does not begin with fixed typologies but is more data-driven, i.e. the investigator first looks at the details generated at the crime scene and applies statistical procedures to analyse this data. Details from past crime scenes are stored and act as a base for making comparisons. This means that current offences can be matched with past ones and generate expectations about the offenders' personal history, family background, etc.	'Bottom-down' is an unfortunate error but this does not detract from the quality of the description.
The bottom-up approach is more grounded in evidence than the US system in that the whole system is based on a database of previous cases. An example of the kind of statistical techniques that are used is one developed by Canter and Heritage who use the statistical technique smallest space analysis to identify patterns of behaviour in over 60 sexual assault cases. This supports the usefulness of investigative psychology because it shows how statistical techniques can be applied.	The first criticism is well-illustrated using relevant evidence. The last two paragraphs contain well-elaborated evaluation too.
A particular strategy developed by Canter was the geographical profile that an offender's operational base and possible future offences are revealed by the geographical location of their previous crimes. In Canter's circle theory, he identified the 'marauder' who works within a small radius of where he lives and the 'commuter' who will travel to the crime location.	The limitation to this answer is that Luke should have made time to reflect on the essay stem throughout the answer. Though this is still a strong answer, he should have considered whether the British approach is also a 'waste of time'. But it is a well-balanced response in terms of description and evaluation.
This also has supportive research evidence, for example Lundrigan and Canter put together information from 120 murder cases involving serial killers in the US. Smallest space analysis revealed spatial consistency in the behaviour of the killers. This supports Canter's claim that spatial information is a key factor in determining the base of an offender. **(480 words)**	

Multiple-choice questions

Offender profiling: The top-down approach

1. The top-down approach is *most* associated with the:
   (a) FBI.
   (b) MFI.
   (c) MI5.
   (d) CIA.

2. Which of the following is *most* associated with an organised offender?
   (a) Married.
   (b) Low IQ.
   (c) Sexual problems.
   (d) Irrational and stressed during the incident.

3. Which of the following is *most* associated with a disorganised offender?
   (a) Leaves few clues.
   (b) Carefully planned.
   (c) In skilled work.
   (d) Lives alone.

4. Who concluded organised and disorganised are on more of a continuum?
   (a) Canter *et al.*
   (b) Meketa.
   (c) Mischel.
   (d) Godwin.

Offender profiling: The bottom-up approach

1. Which of the following is *not* associated with the bottom-up approach?
   (a) Data-driven.
   (b) Profile emerges from analysis of crime scene.
   (c) Use of typologies.
   (d) Investigative psychology.

2. Which of the following is *most* associated with the geographical approach?
   (a) Interpersonal coherence.
   (b) The significance of the time of the incident.
   (c) Spatial consistency.
   (d) Forensic awareness.

3. An offender who operates close to their operational base is known as a:
   (a) Marauder.
   (b) Commuter.
   (c) Navigator.
   (d) Promoter.

4. Which of the following is *not* an advantage the bottom-up approach has in comparison with the top-down approach?
   (a) It can be applied to a greater range of crimes.
   (b) It is based on statistical techniques.
   (c) It is grounded in psychological theory.
   (d) It was developed through interviews with real serial killers.

Biological explanations: An historical approach

1. Lombroso thought criminals were genetic:
   (a) Throwbacks.
   (b) Slingbacks.
   (c) Drawbacks.
   (d) Setbacks.

2. Which of the following is *not* a physical feature associated with murderers?
   (a) Short fingers.
   (b) Bloodshot eyes.
   (c) Curly hair.
   (d) Long ears.

3. In Lombroso's study what percentage of crimes did he claim could be accounted for by atavistic characteristics?
   (a) 25%.
   (b) 40%.
   (c) 66%.
   (d) 80%.

4. Goring's study was an improvement on Lombroso's because it included:
   (a) Double-blind procedures.
   (b) Real criminals.
   (c) A control group.
   (d) Analysis of cranial features.

Biological explanations: Genetic and neural

1. The degree of similarity between twin pairs and family members on a specific characteristic is known as:
   (a) Concurrence.
   (b) Accordance.
   (c) Occurrence.
   (d) Concordance.

2. Individuals with antisocial personality disorder may have reduced activity in:
   (a) The prefrontal cortex.
   (b) The parietal cortex.
   (c) The peripheral cortex.
   (d) The presynaptic cortex.

3. In the Mednick *et al.* study, when both biological and adoptive parents had convictions, the percentage of adoptees that had convictions was:
   (a) 2%.
   (b) 24.5%.
   (c) 44.5%.
   (d) 71%.

4. A variant of which gene is linked to serotonin?
   (a) CDH13.
   (b) CFD3.
   (c) MOAO.
   (d) MAOA.

Psychological explanations: Eysenck's theory

1. Eysenck suggested that the criminal type would score highly on measures of extraversion, neuroticism and which other characteristic?
   (a) Introversion.
   (b) Stability.
   (c) Psychoticism.
   (d) Barbarism.

2. Which of the following is *not* associated with extraverts?
   (a) An underactive nervous system.
   (b) Seek excitement and stimulation.
   (c) Engage in risk-taking behaviour.
   (d) Easy to condition.

3. Farrington *et al.* (1982) found that offenders scored:
   (a) High on E measures but not for P or N.
   (b) High on N measures but not for E or P.
   (c) High on P measures but not for E or N.
   (d) High on E, N and P measures.

4. According to Moffitt, a career criminal is:
   (a) Lifetime-offensive.
   (b) Life-course-persistent.
   (c) Lifelong-deviant.
   (d) Lifestyle-achievement.

Psychological explanations: Cognitive

1. Which of the following is *not* part of Kohlberg's model?
   (a) Multi-conventional reasoning.
   (b) Pre-conventional reasoning.
   (c) Conventional reasoning.
   (d) Post-conventional reasoning.

2. 'A tendency to interpret the behaviour of others as threatening or confrontational' describes:
   (a) Minimalisation.
   (b) Euphemistic label.
   (c) Hostile attribution bias.
   (d) Moral reasoning.

3. Studies suggest this group is particularly prone to minimalisation:
   (a) Burglars.
   (b) Sex offenders.
   (c) Serial killers.
   (d) Arsonists.

4. The main application of cognitive distortions:
   (a) Central control therapy.
   (b) Offender motivation therapy.
   (c) Cognitive behaviour therapy.
   (d) Combined intervention therapy.

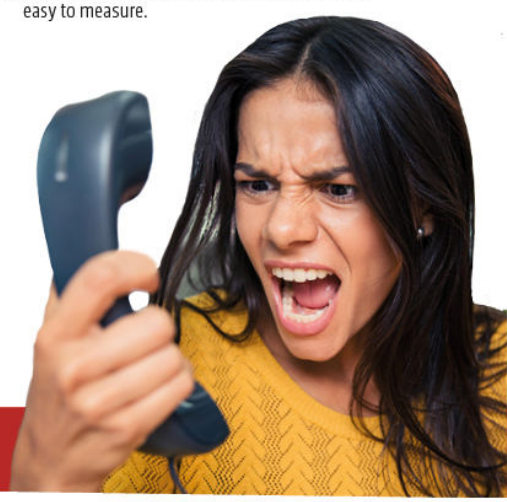
Psychological explanations: Differential association theory

1. Sutherland argues that people will commit crime when:
   (a) More pro-crime attitudes than anti-crime.
   (b) More anti-crime attitudes than pro-crime.
   (c) Pro-crime attitudes same as anti-crime.
   (d) They have no pro-crime or anti-crime attitudes.

2. If mathematically calculating the likelihood of offending, which would *not* be required:
   (a) Type of deviant norms.
   (b) Frequency of deviant norms.
   (c) Intensity of deviant norms.
   (d) Duration of deviant norms.

3. Sutherland coined which term?
   (a) Blue-collar crime.
   (b) Blue-shirt crime.
   (c) White-shirt crime.
   (d) White-collar crime.

4. Which of the following is *not* a strength of Sutherland's theory?
   (a) Can account for crimes in different sectors of society.
   (b) Shifted focus away from individual accounts of crime.
   (c) Drew attention to the importance of deviant environments.
   (d) Exposure to pro- and anti-criminal attitudes is easy to measure.



Psychological explanations: Psychodynamic

1. Which of the following is *not* a form of inadequate Superego identified by Blackburn?
   (a) Weak Superego.
   (b) Infantile Superego.
   (c) Deviant Superego.
   (d) Over-harsh Superego.
2. The Superego is based on the:
   (a) Reality principle.
   (b) Morality principle.
   (c) Ethical principle.
   (d) Gratification principle.
3. Which of the following is a long-term effect of maternal deprivation?
   (a) Delinquent behaviour.
   (b) Affectionate behaviour.
   (c) Empathy.
   (d) Guilt.
4. How many of Bowlby's affectionless psychopaths had experienced prolonged separation from their mother?
   (a) 14.
   (b) 12.
   (c) 44.
   (d) 0.

Dealing with offending behaviour: Custodial sentencing

1. Which of the following is 'society enacting revenge by making the offender suffer'?
   (a) Rehabilitation.
   (b) Deterrence.
   (c) Incarceration.
   (d) Retribution.
2. Which of the following is *not* a psychological effect of custodial sentencing?
   (a) Prisonisation.
   (b) Recidivism.
   (c) Institutionalisation.
   (d) Depression.
3. Young single men are most at risk of suicide in the first _____ of prison.
   (a) Fortnight.
   (b) Week.
   (c) 24 hours.
   (d) Hour.
4. The UK rate of recidivism within a year of being released from prison is about:
   (a) 25%.
   (b) 35%.
   (c) 45%.
   (d) 55%.

Dealing with offending behaviour: Behaviour modification in custody

1. The token economy system is based on what form of learning?
   (a) Vicarious conditioning.
   (b) Classical conditioning.
   (c) Operant conditioning.
   (d) Observational learning.
2. Hobbs and Holt studied:
   (a) Murderers.
   (b) Female prisoners.
   (c) Recidivists.
   (d) Young offenders.
3. Who found that behaviour modification had to be applied consistently to be effective?
   (a) Cohen and Filipczak.
   (b) Hobbs and Holt.
   (c) Bassett and Blanchard.
   (d) Allyon and Milan.
4. Removing tokens to encourage compliant behaviour is a form of:
   (a) Positive reinforcement.
   (b) Primary reinforcement.
   (c) Punishment.
   (d) Vicarious reinforcement.

Dealing with offending behaviour: Anger management

1. Which of the following is *not* one of the phases of anger management?
   (a) Mental restructuring.
   (b) Cognitive preparation.
   (c) Skills acquisition.
   (d) Application practice.
2. Which of these would *not* be part of 'skills acquisition'?
   (a) Learning positive self-talk.
   (b) Assertiveness training.
   (c) Exercises on how to communicate more effectively.
   (d) Exchanging tokens for rewards.
3. Keen *et al.* studied young offenders who had participated in the:
   (a) National Anger Management Package.
   (b) Offender's Anger Management Package.
   (c) British Anger Management Package.
   (d) Anger Management Reduction Package.
4. Which of the following approaches is *not* part of the skills acquisition stage of anger management?
   (a) Behavioural.
   (b) Cognitive.
   (c) Psychodynamic.
   (d) Physiological.

Dealing with offending behaviour: Restorative justice

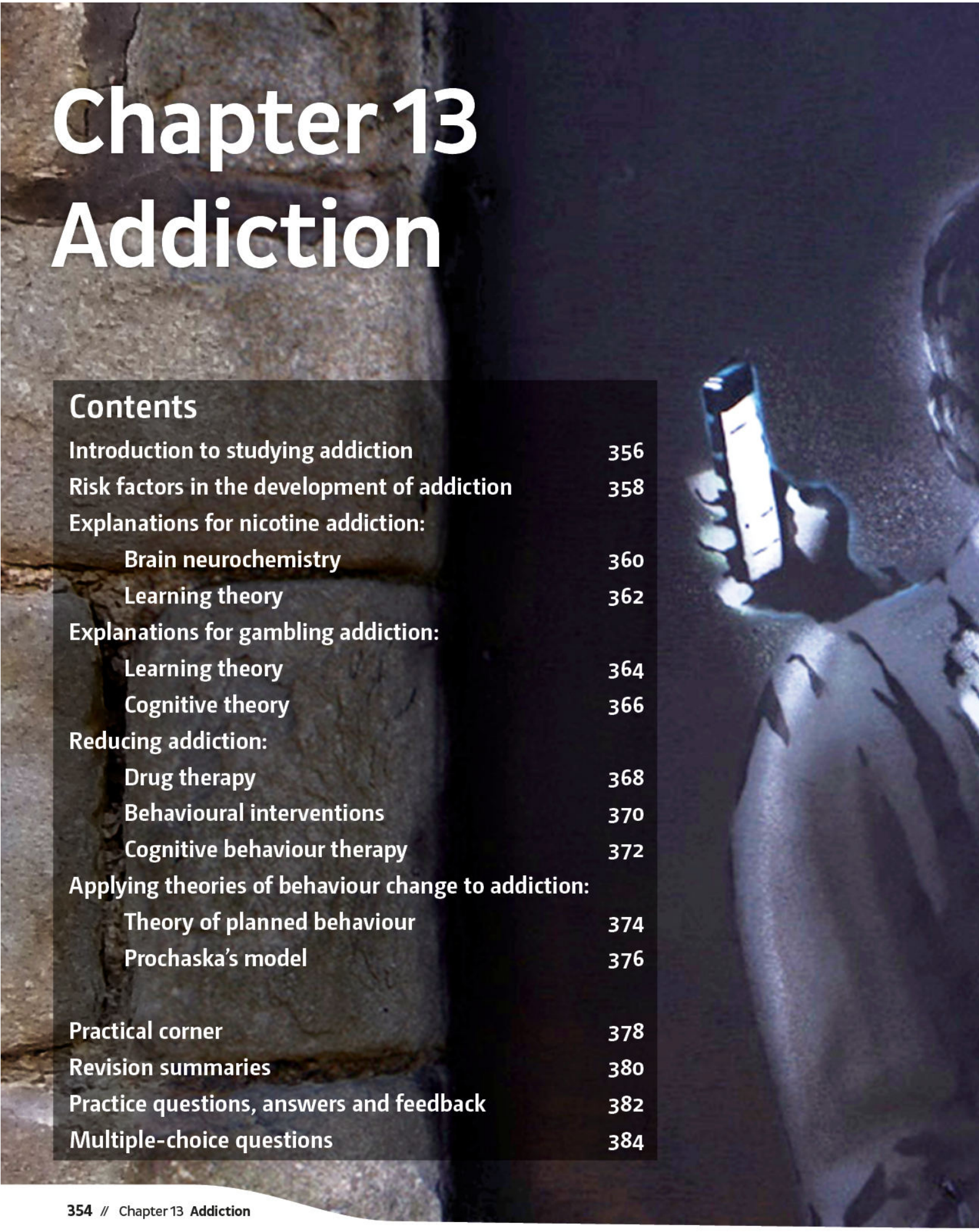
1. An offender seeing the hurt their actions caused is an important part of what process?
   (a) Rehabilitation.
   (b) Recidivism.
   (c) Retribution.
   (d) Prisonisation.
2. Which of the following would *not* be a function of restorative justice?
   (a) As an alternative to prison.
   (b) As an addition to prison.
   (c) As an incentive to reduce an existing sentence.
   (d) As a form of reward in a token economy scheme.
3. Percentage of survivors who said restorative justice made them feel worse?
   (a) 0%.
   (b) 1%.
   (c) 2%.
   (d) 3%.
4. Braithwaite said, 'Crime hurts, justice should...':
   (a) Be served.
   (b) Repair.
   (c) Hurt more.
   (d) Heal.



MCQ answers

Chapter opener questions – all 10 are true
Offender profiling: The top-down approach 1A, 2A, 3D, 4D
Offender profiling: The bottom-up approach 1C, 2C, 3A, 4D
Biological explanations: An historical approach 1A, 2A, 3B, 4C
Biological explanations: Genetic and neural 1D, 2A, 3B, 4D
Psychological explanations: Eysenck's theory 1C, 2D, 3C, 4B
Psychological explanations: Cognitive 1A, 2C, 3B, 4C
Psychological explanations: Differential association theory 1A, 2A, 3D, 4D
Psychological explanations: Psychodynamic 1B, 2B, 3A, 4B
Dealing with offending behaviour: Custodial sentencing 1D, 2B, 3C, 4C
Dealing with offending behaviour: Behaviour modification in custody 1C, 2D, 3C, 4C
Dealing with offending behaviour: Anger management 1A, 2D, 3A, 4C
Dealing with offending behaviour: Restorative justice 1A, 2D, 3C, 4D

Chapter 13 Addiction



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Heroin, gambling, sex, cocaine, cigarettes, booze, pies, chocolate, caffeine, danger, your phone.

What is addiction?

Is it possible to become addicted to these things?

How would you know if you were addicted to your phone?

Introduction to studying addiction

The specification says...

Describing addiction: physical and psychological dependence, tolerance and withdrawal syndrome.

Risk factors in the development of addiction, including genetic vulnerability, stress, personality, family influences and peers.

Addiction is a term included in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). It is an official diagnostic label, albeit only since 2013. On this spread we look at what is involved in addiction and we also begin our study of the risk factors for addiction (which continues on the next spread).

Key terms

Addiction A disorder in which an individual takes a substance or engages in a behaviour that is pleasurable but eventually becomes compulsive with harmful consequences. Marked by physiological and/or psychological dependence, tolerance and withdrawal.

Physical dependence A state of the body due to habitual substance abuse which results in a withdrawal syndrome when use of the drug is reduced or stopped.

Psychological dependence A compulsion to continue taking a substance (or continue performing a behaviour) because its use is rewarding.

Tolerance A reduction in response to a substance, so that an addicted individual needs more to get the same effect.

Withdrawal syndrome A set of symptoms that develop when an addicted person abstains from or reduces their substance abuse.

Risk factors Any internal or external influence that increases the likelihood a person will start using addictive substances or engage in addictive behaviours.

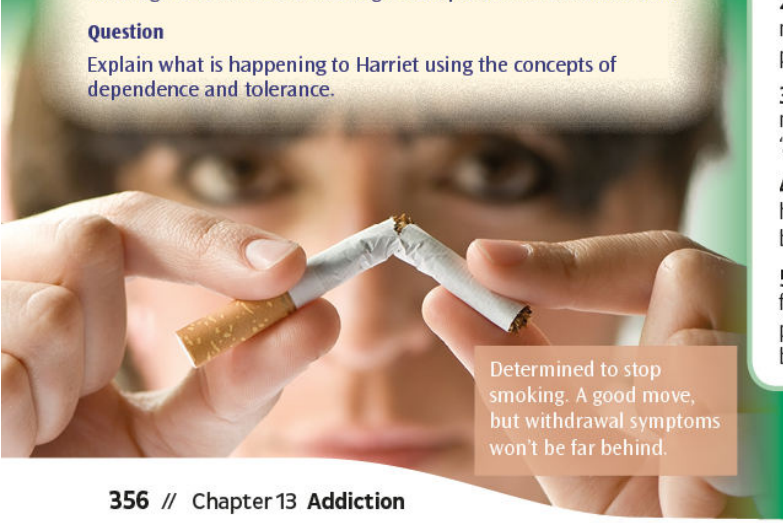
Activity

Apply it
Concepts
Harriet and smoking

Harriet is a long-term smoker who has always found having a cigarette relaxing – it calms her nerves and helps her to cope with stress. But she has found over the months that her daily intake has gradually crept up, and she doesn't quite get the same pleasure from smoking as she once did. But she still gets cravings for a cigarette when she has to go a couple of hours without one.

Question

Explain what is happening to Harriet using the concepts of dependence and tolerance.



Determined to stop smoking. A good move, but withdrawal symptoms won't be far behind.

Describing addiction

Addiction is more than simply doing something a lot. Key characteristics that are used to establish whether a behaviour is 'addiction' include dependence, tolerance and withdrawal symptoms.

Physical and psychological dependence

Physical dependence is defined in terms of withdrawal. It's only possible to establish for certain that someone is physically dependent on a substance when they abstain from it. Physical dependence is said to have occurred when a **withdrawal syndrome** is produced by reducing or stopping intake (see below).

Psychological dependence refers to the compulsion to experience the effects of a substance, usually in terms of an increase in pleasure or a lessening of discomfort. Either way, taking the substance is reliably followed by a reward. A consequence of psychological dependence is that the person will keep taking the substance (or engage in a behaviour) until it becomes a habit, despite the harmful consequences.

Tolerance

Tolerance occurs when an individual's response to a given amount of a substance is reduced. This means they need ever greater doses to produce the same effect. So tolerance is caused by repeated exposure to the effects of a substance.

One type of tolerance is *behavioural tolerance* which happens when an individual learns through experience to adjust their behaviour to compensate for the effects of a substance. For instance, people addicted to alcohol learn to walk more slowly when they are drunk to avoid falling over.

A special instance of tolerance is *cross-tolerance*, whereby developing tolerance to one type of substance (e.g. alcohol) can reduce sensitivity to another type (e.g. **benzodiazepines**). This is a classic issue in surgery. People who have developed a tolerance to the sleep-inducing effects of alcohol need higher doses of anaesthetic. Cross-tolerance can be used therapeutically by giving benzodiazepines to people withdrawing from alcohol to reduce the withdrawal syndrome.

Risk factors in the development of addiction: an overview

A risk factor is anything that increases the chances that someone will form an addiction (or engage in an addictive behaviour). The term 'risk factor' may also be used when explaining why a person increases their current level of use.

There are five key risk factors, each of which is briefly described here and explained in more detail on the next spread:

1. Genetic vulnerability People do not inherit an addiction itself, they inherit a predisposition ('vulnerability') to dependence. Genes may determine the activity of **neurotransmitter** systems (e.g. **dopamine**) in the brain, which in turn affect behaviours such as impulsivity that predispose a person to dependence.

2. Stress People who experience **stress** may turn to drugs as a form of self-medication (i.e. to experience pleasure or avoid pain). 'Stress' includes present and past events (such as trauma in childhood).

3. Personality Individual **personality** traits such as hostility and **neuroticism** may increase the risk of addiction. But there is probably no such thing as an 'addictive personality'.

4. Family influences Living in a family which uses addictive substances and/or has positive attitudes about addictions increases a person's likelihood of becoming addicted.

5. Peers As children get older, peer relationships become the most important risk factor for addiction, outstripping family influences. Even when an adolescent's peers have not used drugs themselves, their attitudes towards drugs may still be influential.

Practical activity on page 379

Withdrawal syndrome

A withdrawal syndrome is a collection of symptoms associated with abstaining from an addictive substance or reducing its use. The specific collection of symptoms is unique to each category of substance (e.g. nicotine, alcohol, etc.) and is predictable. The symptoms are almost always the opposite of the ones created by the substance. For instance, a smoker may find that smoking relaxes them, but withdrawal from nicotine (the active ingredient) produces anxiety, irritability and agitation (as well as increased appetite and weight gain).

The existence of withdrawal indicates that a physical dependence has developed. Once dependence develops, an addicted person experiences some symptoms of withdrawal whenever they cannot get the substance. This happens relatively often so they become familiar with these symptoms, which are unpleasant and cause discomfort. So the motivation for continuing to take a substance is partly to avoid the withdrawal symptoms, a secondary form of psychological dependence.

Withdrawal typically has two phases:

1. The *acute withdrawal phase* begins within hours of abstaining and features intense cravings for the substance, reflecting strong physiological and psychological dependence. The symptoms gradually diminish, usually over days.
2. The *prolonged withdrawal phase* includes symptoms that continue for weeks, months and even years. The person becomes highly sensitive to the cues they associate with the substance (e.g. lighters, rituals, locations). This is one reason why relapse is so common.

Study tip

Addiction – everyone's got an opinion, however anecdotal evidence is no substitute for scientific research. Anything you say must be backed up by psychological research.

Evaluation

Interactions between factors

One limitation of focusing on individual risk factors is that it means we ignore the effect of interactions and also may ignore the positive effects.

No one risk factor is causal in addiction. Combinations of risk matter more than single factors. Linda Mayes and Nancy Suchman (2006) point out that different combinations partly determine the nature and severity of an addiction. Also, the factors we have described as 'risky' can be protective – personality traits, genetic characteristics, family and peer influences can reduce the risk of addiction (e.g. greater parental monitoring and lower levels of impulsivity).

Therefore a more realistic view of risk is to think in terms of multiple 'pathways' to addiction which include different combinations interacting and some having a positive effect.

Central role of genes

One strength of looking at risk factors together is that they point to the overriding interaction with genes.

Most risk factors are *proximate* (i.e. they act as an immediate influence on addiction). For example, high stress levels directly increase addiction risk as does the personality trait of novelty-seeking (craving new experiences). But how we respond to stress and the extent to which we seek novelty are both partly genetic (Rey *et al.* 2009). So to fully understand risk factors, we have to look further back in the chain of influences to the *ultimate* risk factor. In many cases it is genetic.

Therefore, genetic vulnerability may be the most significant risk factor because it has the ultimate influence on the others.



If an addiction runs in families, is this evidence of a genetic vulnerability, a family influence, or both?

Apply it Concepts — Mick and gambling

Mick spends a lot of money playing online fruit machines for several hours most days. Although he's a bit worried he might be addicted, he loves the thrill and excitement of playing, and it takes his mind off the stresses of his everyday life when he can feel his anxieties drop away. But there are times when Mick can't get online, so he starts to feel irritable, anxious and jittery, just constantly thinking about fruit machines.

Question

Explain Mick's behaviour using the concept of withdrawal syndrome.

Apply it Concepts — Gabrielle at risk

Gabrielle is 16 years old and has just started hanging around with a group of girls at school. They are a popular bunch and seem to be viewed by most other students as cool and fun to be around. They somehow manage to get hold of bottles of beer every now and then so spend a fair bit of their time drinking around the local shopping centre. Gabrielle has joined in a couple of times. Everyone else in her family drinks so she reckons they obviously don't have a problem with it.

Question

Using your knowledge of addiction, explain **two** risk factors that could contribute to Gabrielle's drinking. Refer to some relevant research in your explanation.

Check it

1. In relation to addiction, what is meant by 'tolerance' and 'withdrawal'? *[2 + 2 marks]*
2. Explain the difference between psychological and physical dependence. *[4 marks]*
3. Briefly explain **one** risk factor for addiction. *[2 marks]*
4. Explain how withdrawal might occur in someone who is addicted to nicotine. In your answer, give **two** examples of the effects of withdrawal. *[4 marks]*

Risk factors in the development of addiction

The specification says...

Risk factors in the development of addiction, including genetic vulnerability, stress, personality, family influences and peers.

Two of the risk factors (genetic vulnerability and personality) are internal factors that may increase the likelihood of some people developing an addiction. The others (stress, family influences and peers) are external environmental or context factors. But, as we saw on the previous spread, all of these factors interact to influence a person's risk.

Key terms

Risk factors Any internal or external influence that increases the likelihood a person will start using addictive substances or engage in addictive behaviours.

Genetic vulnerability Any inherited predisposition that increases the risk of a disorder or condition.

Stress Stressful life events and traumatic experiences in childhood and adulthood are important risk factors for addiction.

Personality Various traits can increase an individual's risk of addiction, a significant one being impulsivity.

Family influences How much the at-risk individual believes his or her parents approve of addictive substances or behaviours is an influential risk factor, along with others involving family relationships.

Peers The attitudes of peers towards addictive substances/behaviours becomes highly influential in increasing the risk of an addiction developing in adolescence.

Peer relationships – an even more influential risk factor for addiction at this age than parents.



Risk factors in the development of addiction

On the previous spread we looked briefly at each of the five main risk factors. We will now take a more detailed look.

Genetic vulnerability

There are two plausible direct mechanisms that create a **genetic vulnerability** to **addiction**:

1. D2 receptor – **dopamine** transmission is affected by the number of dopamine receptors you have, and this number is genetically controlled. There are different types of dopamine receptor, including the D2 receptor. People who are addicted have been found to have an abnormally low number of D2 receptors. Fewer receptors means less dopamine activity, so using drugs is a way of compensating for this deficiency.
2. Nicotine enzyme (CYP2A6) – some individuals are more able to metabolise (i.e. break down) certain substances and this is linked to addiction. Michael Pianezza *et al.* (1998) found that some people lack a fully functioning enzyme (CYP2A6) which metabolises nicotine. They also smoke significantly less than those smokers with the fully functioning version. Expression of the CYP2A6 enzyme is genetically determined.

Stress

Susan Andersen and Martin Teicher (2008) highlight the role of *adverse childhood experiences* (ACEs) in later addiction. They argue that early experiences of severe **stress** have damaging effects on a young brain in a sensitive period of development. This creates a vulnerability to later stress.

Further stressful experiences in adolescence and adulthood trigger the early vulnerability and make it more likely that such a person will self-medicate with drugs or other behavioural addictions.

Personality

There is no such thing as a generally addictive **personality** but addiction is linked to disordered personality. Most people with **antisocial personality disorder** (APD) are also addicted substance abusers (e.g. Petry 2002).

Lee Robins (1998) argues that APD is a causal risk factor for addiction because having APD means that a person breaks social norms, is impulsive and may behave criminally. Therefore it is almost inevitable that someone with APD will try drugs at a young age because drug-taking offers a combination of norm-breaking, criminal activity and also satisfying one's own desires.

Family influences

Family influences are apparent in, for example, alcohol addiction. Jennifer Livingston *et al.* (2010) found that final-year high-school students who were allowed by their parents to drink alcohol at home were significantly more likely to drink excessively the following year at college.

Also, adolescents who believe that their parents have little or no interest in monitoring their behaviour (e.g. internet use, peer relationships) are more likely to develop an addiction. The key determinant here is the adolescent's *perception*. This is more important than whether or not parents really monitor the adolescent's behaviour.

Peers

Mary O'Connell *et al.* (2009) suggest there are three major elements to **peer** influence as a risk factor for alcohol addiction:

- An at-risk adolescent's attitudes and norms about drinking are influenced by associating with peers who use alcohol.
- These experienced peers provide more opportunities for the at-risk individual to use alcohol.
- The individual overestimates how much their peers are drinking, which means they drink more to keep up with the perceived norm.

Peer attitudes that ultimately influence substance abuse do not have to specifically concern the substances. What matters is the creation of a group norm that favours rule-breaking generally, and substance abuse is just one instance of this.

Study tip

The term 'substance abuse' refers to using a substance (drug) for a bad purpose (e.g. getting high instead of for medication). 'Substance misuse' refers to using a drug in the wrong way (e.g. taking a high dosage) or wrong purpose (e.g. using sleeping pills to suppress dreams).

Evaluation

Genetic vulnerability

One strength of genetic vulnerability as a risk factor for addiction is support from adoption studies.

Kenneth Kendler *et al.* (2012) used data from the National Swedish Adoption Study. They looked especially at adults who had been adopted away, as children, from biological families in which at least one parent had an addiction. These children later had a significantly greater risk of developing an addiction themselves, compared with adopted-away individuals with no addicted parent in their biological families.

This supports the role of genetic vulnerability as an important risk factor, and it is supported by other research (e.g. **twin studies**).

Stress

One limitation of research into stress as a risk factor for addiction is the issue of causation.

Many studies have shown there is a strong **positive correlation** between stressful experiences and addiction. However, this does not necessarily mean that stress is the risk factor. What matters is the order in which the stress and the addiction developed. Some people may well become addicted even though they have not experienced any significant life stress. Their addictions then create greater levels of stress in their lives because of the negative effects of the lifestyle. This would still produce a positive correlation but in this case addiction caused the stress rather than vice versa.

Therefore we cannot conclude stress is a significant risk factor based on correlational studies alone.

Personality

One strength of personality as a risk factor for addiction is support for the link between addiction and APD.

Several studies show that APD and alcohol dependence are **co-morbid** (i.e. they frequently occur together). But is APD a causal factor? Miriam Bahlmann *et al.* (2002) interviewed 55 alcohol-dependent people of which 18 were also diagnosed with APD. For these 18 participants, the researchers found that APD developed four years before their alcohol dependency, on average.

This finding suggests that APD is indeed a personality-related risk factor for alcohol addiction.

Family influences

One strength is research support for family influences as a risk factor.

For example, Bertha Madras *et al.* (2019) found a strong positive correlation between parents' use (abuse) of cannabis and their adolescent children's use of cannabis, nicotine, alcohol and opioids. It may be that adolescents observe their parents using a specific drug (e.g. cannabis) and **model** this behaviour. They may also infer that their parents approve of drug use generally, so go on to use other drugs.

This supports the view that parental substance abuse is a potential risk factor for wider addiction in adolescent offspring.

Peers

One strength of peers as a risk for addiction is real-world application.

Social norms marketing advertising (SNMA) is an intervention to change mistaken beliefs about how much peers are drinking. It uses mass media advertising to provide messages and statistics about how much people really drink. For example, beer mats, posters and leaflets in a Student Union bar might carry messages such as 'Students overestimate what others drink by 44%'. Students then get a more accurate picture to correct their overestimations.

This means that identification of risk factors can suggest ways to reduce the influence of such factors.

Apply it Concepts — Will Tarvin smoke?

Tarvin is 16 years old and has always done things on the spur of the moment. He often doesn't think things through and this usually gets him into a lot of trouble. He's behind at school, finds it difficult to concentrate and everyone sees him as a troublemaker. What most people don't realise is that this situation is quite stressful for him, especially with mock exams coming up. A couple of days ago, he took some of his dad's cigarettes and plans to smoke them.

Question

Referring to relevant research, explain *two* risk factors that could lead to Tarvin becoming addicted to nicotine.



Impulsive and risk-taking personality traits developing in childhood could lead to addiction in adolescence.

Apply it Methods — A case of addiction?

A psychologist decided to carry out a case study of a man experiencing several risk factors for addiction. She asked the participant to keep a daily diary of incidents involving four major risk factors, and any experiences involving alcohol. She used content analysis to summarise the data from the diaries. She found that 20% of the diary entries related to stressful events, 25% to family influences, 10% to the participant's personality, and 35% to the participant's peer group. 10% of the entries could not be classified.

Questions

1. Explain how the psychologist could have carried out her **content analysis**. (*4 marks*)
2. The **case study** gathered a lot of **qualitative data**. Explain what is meant by qualitative data. (*2 marks*)
3. Outline *one* limitation of gathering qualitative data in this study. (*2 marks*)
4. Explain *one* strength of using a **case study** to conduct research on addiction in young people. (*2 marks*)
5. Explain *one* **ethical issue** that could arise in this study and how the psychologist could have dealt with it. (*2 marks + 2 marks*)

Check it

1. In relation to risk factors for addiction, explain what is meant by 'genetic vulnerability' **and** 'family influences'. *[2 marks + 2 marks]*
2. Explain the roles of any **two** risk factors in the development of addiction. *[6 marks]*
3. Describe **and** evaluate risk factors in the development of addiction. *[16 marks]*

Explanations for nicotine addiction: Brain neurochemistry

The specification says...

> Explanations for nicotine addiction: brain neurochemistry, including the role of dopamine.

Addictions to drugs such as heroin, cocaine and LSD attract a great deal of media attention. But they are nowhere near as prevalent and dangerous as addiction to a drug used every day by millions of people, perhaps up to one-third of the global adult population – nicotine, the psychoactive component of tobacco.

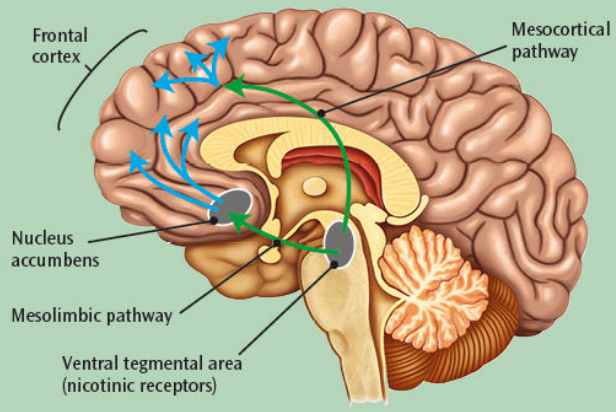
In this spread we look at the neurochemistry of nicotine addiction, in which the neurotransmitter dopamine is thought to have a central role.

Key terms

Neurochemistry Relating to chemicals in the brain that regulate biological and psychological functioning.

Dopamine A neurotransmitter that generally has an excitatory effect and is associated with the sensation of pleasure. Unusually high levels are associated with schizophrenia and unusually low levels are associated with Parkinson's disease.

The desensitisation hypothesis: Nicotine stimulates nicotinic receptors primarily located in the ventral tegmental area (VTA) of the brain. This causes dopamine to be transmitted along the mesolimbic and mesocortical pathways to the nucleus accumbens and the frontal cortex (green arrows). Dopamine is then released into the frontal cortex (blue arrows) creating rewarding effects.



Study tip

What's the Number One route to evaluating a theory or explanation? The answer is – THINK LINK. You'll notice that the evaluation pages on each spread in this book are chock-full of research studies. They are usually there to support or contradict an explanation. But you need to make sure you use them effectively. THINK LINK – how does the evidence relate to the explanation? What does McEvoy *et al.*'s study tell us about the neurochemistry of nicotine addiction? Don't get sidetracked into describing the evidence at length. Instead, THINK LINK – explain how it supports the explanation. That's effective evaluation.

The role of dopamine

One example of how **neurochemistry** is involved in nictotine addiction involves the **neurotransmitter** **dopamine**.

John Dani and Steve Heinemann (1996) focused on dopamine in their *desensitisation hypothesis* of nicotine addiction. The story begins with the neurotransmitter **acetylcholine**.

nAChRs and dopamine

The neurotransmitter acetycholine (ACh) plays a key role in all nervous system activity, which means there are ACh receptors on the surfaces of many **neurons** in the **central nervous system**. One subtype of ACh receptor is called the *nicotinic acetylcholine receptor* (nAChR). These receptors are special because they can be activated by ACh or nicotine (therefore 'nicotinic').

When nAChRs are activated by nicotine molecules, the neuron transmits dopamine. This is immediately followed by shutdown – within milliseconds the nAChRs shut down and temporarily cannot respond to any neurotransmitters.

At this time the neuron is said to be *desensitised*. This leads to *downregulation*, a reduction in the number of active neurons because fewer of them are available.

Creating a pleasurable effect

nAChRs are concentrated in the *ventral tegmental area* (VTA) of the brain. When these nAChRs are stimulated by nicotine, dopamine is transmitted along the **mesolimbic pathway** to the **nucleus accumbens** (NA). This triggers the release of more dopamine from the NA into the **frontal cortex**.

At the same time, dopamine is also transmitted along the **mesocortical pathway** to be released directly in the frontal cortex.

The mesolimbic and mesocortical pathways are part of the brain's dopamine reward system. Nicotine powerfully activates this system and results in pleasurable effects (e.g. mild euphoria, increased alertness and reduction of anxiety). These effects become associated with smoking through **operant conditioning** (see the next spread).

Withdrawal

As long as a person is smoking, nAChRs are continually desensitised. But when the person does not smoke for a prolonged period (e.g. when they are asleep at night) nicotine disappears from their body. Then the nAChRs become functional again, so dopamine neurons *resensitise* and more become available (*upregulation*).

At this time the person is experiencing symptoms of withdrawal from the lack of nicotine. The experience of withdrawal (e.g. anxiety and agitation) can be explained in terms of nAChRs. During resensitisation nAChRs become overstimulated by ACh (because there is no nicotine to bind with them). nAChRs are at their most sensitive at this point. This is why smokers often describe the first cigarette of the day as the most enjoyable – it strongly reactivates the dopamine reward system (as outlined above).

Dependence and tolerance

The smoker avoids unpleasant physiological and psychological withdrawal states by having another cigarette. But this means there is a constant cycle of daytime downregulation and night-time upregulation and this creates long-term desensitisation of nAChRs (i.e. dependence).

Continuous exposure of nAChRs to nicotine causes permanent changes to brain neurochemistry – a decrease in the number of active receptors. Tolerance develops as a smoker has to smoke more to get the same effects.

Apply it

Concepts

Kiki's craving

Kiki is a heavy smoker. Although she wouldn't describe herself as an addict, she knows she would find it almost impossible to give up smoking. She currently smokes about 40 cigarettes a day, including late at night. She often wakes up in the morning with a massive craving to smoke a cigarette, and has noticed how the first one of the day is usually the best.

Question

How would you explain Kiki's behaviour in terms of what is going on with her brain neurochemistry?

Evaluation

Research support

One strength of dopamine explanations of nicotine addiction is support from human research.

Such research has provided indirect support for the role of dopamine. For example, Joseph McEvoy *et al.* (1995) studied smoking behaviour in people with **schizophrenia** who were taking the **antipsychotic** drug Haloperidol. This drug is a dopamine **antagonist**, i.e. it blocks dopamine receptors in the brain thereby reducing dopamine transmission. The people taking the drug showed a significant increase in smoking. This was presumably a form of self-medication – the individuals used nicotine as a means of increasing their depleted dopamine levels.

This supports the view that dopamine has a key role in the neurochemistry of nicotine addiction.

Counterpoint However, explanations of nicotine addiction that consider only the role of dopamine are limited. The dopamine system is central but research increasingly shows a complex interaction of several neurochemical systems. According to Shelley Watkins *et al.* (2000) these include neurotransmitter pathways (e.g. **GABA** and **serotonin**), plus other systems such as endogenous opioids (endorphins, the brain's natural painkillers).

Therefore, the neurochemistry of nicotine addiction cannot be fully understood if looking at only dopamine.

Real-world application

Another strength is that neurochemistry leads to new treatments.

One example is nicotine replacement therapy (NRT) to help smokers quit. This was developed after nicotine was identified as the addictive component in cigarette smoke with effects on nAChRs. NRT products (e.g. patches, inhalers, gum) deliver a controlled dose of nicotine. This acts neurochemically by binding with nAChRs and mimicking the effects of nicotine from cigarettes, including dopamine release. This satisfies cravings and allows a user to reduce withdrawal symptoms safely by gradually reducing their nicotine dose over weeks.

Therefore, a greater understanding of neurochemistry has led to an effective treatment for nicotine addiction.

Withdrawal symptoms

One limitation is the neurochemical explanation does not fully explain withdrawal.

According to the theory, withdrawal symptoms depend mainly upon the amount of nicotine in the body (i.e. blood concentration levels). However, David Gilbert (1995) points out that these factors are not strongly **correlated**. He argues instead that withdrawal depends much more on environment and personality. For example, people who score high on the personality dimension of **neuroticism** generally experience worse withdrawal symptoms than people who are emotionally stable.

Therefore withdrawal effects can be explained in other ways without reference to amounts of nicotine.

Evaluation eXtra

Determinism

The neurochemical explanation is biologically determinist, suggesting we become addicted to nicotine because of chemical events in the brain involving dopamine reward that are beyond our control, including withdrawal. So nicotine addiction is inevitable in someone who starts smoking.

On the other hand, nicotine addiction may not be inevitable. Some people smoke without becoming dependent and show no withdrawal symptoms when they stop (Shiffman and Paty 2006). Some smokers find it easier to stop than others due to their personality, for example Gilbert's research on neuroticism (above).

Consider: *To what extent is nicotine addiction inevitable?*



The first cigarette of the day – most smokers find it the nicest because of overnight upregulation.

Apply it Concepts — The never-ending habit

Bart has smoked cigarettes for nearly two decades and has noticed that he is smoking more and more each day as the years have gone by. Despite this, he feels he doesn't get the same feeling from smoking that he used to and is worried that this means he'll just keep on increasing his intake more and more.

Question

Using your knowledge of the neurochemistry of addiction, explain why this is happening to Bart.

Apply it Methods — A smoking correlation

Saul Shiffman *et al.* (1995) investigated several differences between 25 'chippers' (very light, long-time smokers) and a matched group of 25 regular smokers. All participants smoked normally for two days and were deprived of nicotine for two days. These two-day periods were separated by a week. The order in which participants completed these periods was counterbalanced. Chippers showed no apparent withdrawal effects. But regular smokers experienced more cravings, poorer mood and sleep disturbances. They also performed more slowly on cognitive tasks.

Questions

1. Write an appropriate **aim** for this study. (*2 marks*)
2. What does it mean by saying the two groups were **matched**? (*2 marks*)
3. What does it mean by saying the 'order in which participants completed these periods was **counterbalanced**'? (*2 marks*)
4. Identify *one* **dependent variable** in this study and explain how you would **operationalise** it. (*1 mark + 2 marks*)
5. Explain how the researchers could have obtained their samples of chippers and regular smokers. Identify the **sampling method** you have chosen. (*2 marks + 1 mark*)

Check it

1. Outline the role of dopamine in nicotine addiction. *[4 marks]*
2. Outline the brain neurochemistry explanation of nicotine addiction. *[6 marks]*
3. Describe **and** evaluate **one or more** neurochemical explanations of nicotine addiction. *[16 marks]*

Explanations for nicotine addiction: Learning theory

The specification says...

Explanations for nicotine addiction: learning theory as applied to smoking behaviour, including reference to cue reactivity.

When habitual smokers smoke cigarettes that contain no nicotine, they report almost identical levels of enjoyment to when they smoke the real thing. Non-nicotine cigarettes can even reduce the withdrawal symptoms that occur when a smoker kicks their habit (Rose and Corrigall 1997). This strongly implies that there is more to nicotine addiction than brain neurochemistry.

Key terms

Learning theory A behaviourist explanation based on the mechanisms of classical and operant conditioning, such as positive and negative reinforcement.

Cue reactivity Cravings and arousal can be triggered in, for instance, nicotine addicts when they encounter cues related to the pleasurable effects of smoking. Examples of such cues include the social situations in which they have smoked previously.

Apply it
Concepts

No going back?

Simon is a 40-year-old man who recently gave up smoking after several years, mainly because he was concerned about his health and how he couldn't play squash as well as he used to.

But he is finding it very hard to stay away from cigarettes for several reasons. He is friends with the same group of people who carry on smoking, he still likes to go out with them to pubs and clubs, and he carries his favourite lighter round with him as a kind of souvenir.

Question

Do you think Simon is at risk of relapsing back into smoking? Use your knowledge of learning theory to explain why.

Learning theory of smoking behaviour

One plausible psychological explanation is that nicotine addiction is a learned behaviour and can be explained in terms of learning theory, i.e. **operant conditioning** and/or **classical conditioning**.

Operant conditioning

Positive reinforcement Nicotine addiction can be partly explained by the concept of **positive reinforcement**. If the consequence of a behaviour is rewarding to an individual (e.g. a feeling of pleasure), then that behaviour is more likely to occur again. Nicotine is a powerful reinforcer because of its physiological effects on the **dopamine** reward system of the **mesolimbic pathway** (see previous spread). The drug stimulates release of dopamine in the **nucleus accumbens**, producing a feeling of mild euphoria, which the smoker finds rewarding and which positively reinforces their smoking behaviour.

According to George Koob and Michel Le Moal (2008), positive reinforcement can therefore explain the early stages of smoking addiction (i.e. how people start smoking in the first place).

Negative reinforcement A smoker's continuing dependence on nicotine is better explained by **negative reinforcement**. Cessation of nicotine leads to an acute withdrawal syndrome, with several unpleasant symptoms. These include behavioural effects (e.g. agitation and disturbed sleep), cognitive effects (e.g. poor concentration) and mood disturbances (e.g. anxiety and depression). Such wide-ranging withdrawal symptoms make it hard for the smoker to abstain for long, so they reduce and/or eliminate these effects by smoking again.

Therefore, smoking another cigarette is negatively reinforcing because it stops an unpleasant stimulus. In fact, smokers become quite skilled at anticipating the symptoms of withdrawal and avoiding them altogether by regulating their nicotine intake (see previous spread).

The role of cue reactivity

The pleasurable effect of smoking is known as a **primary reinforcer**. This is because it is intrinsically rewarding (i.e. not learned) due to its effects on the brain's dopamine reward system. So an individual is more likely to smoke again. Any other stimuli that are present at the same time (or just before) become associated with this pleasurable effect. These other stimuli are called **secondary reinforcers** because they take on the properties of the primary reinforcer and become rewarding in their own right.

Cigarette smoking often occurs in certain environments (smoking areas in pub gardens or colleges) and with certain people (friends). Over time and with repeated associations these environments and friends become secondary reinforcers. Other cues/secondary reinforcers include a favourite lighter, the ritual elements of lighting up, the boxy feel of a cigarette packet and the smell of tobacco. Smokers even come to enjoy the harsh feeling of the smoke hitting the back of the throat, because they associate it with the pleasurable effects of nicotine.

Cue reactivity These stimuli all act as cues, because their presence produces a similar physiological and psychological response to nicotine itself. The term cue reactivity refers to this response, which has three main elements.

1. Subjective desire or craving for a cigarette, which is self-reported.
2. Physiological signs of reactivity, including autonomic responses such as heart rate and skin temperature.
3. Objective behavioural indicators such as how many 'draws' are taken on a cigarette and how strongly.



Friends, parties, music, dancing, drinking. Exactly the sort of enjoyable situation that provides countless cues to entice people back into smoking.

Evaluation

Research support

One strength is support for the learning approach from animal studies.

There is a substantial body of research with non-human animals confirming the role of operant conditioning in nicotine addiction. For example, in a study by Edward Levin *et al.* (2010) rats could lick two water spouts. Licking one of them triggered an intravenous dose of nicotine, but licking the other led to no reward. The rats licked the nicotine-linked waterspout **significantly** more often. The number of licks also increased substantially over 24 sessions.

This suggests that the effects of nicotine positively reinforce self-administration in rats, implying there is a similar mechanism in humans.

Support for cue reactivity

Another strength is support from research with humans for the effects of cues.

Brian Carter and Stephen Tiffany (1999) conducted a **meta-analysis** of 41 studies into cue reactivity. Typically, the studies presented dependent and non-dependent smokers (and non-smokers) with images of smoking-related cues (e.g. lighters, ashtrays, cigarette packets). Self-reported desire (craving) was measured along with indicators of physiological arousal (heart rate, etc.). Dependent smokers reacted most strongly to the cues, i.e. they showed increased arousal (physiological) and reported strong cravings to smoke (psychological) even when nicotine was not present.

This shows that dependent smokers learn secondary associations between smoking-related stimuli and pleasurable effects of smoking.

Real-world application

Another strength is that there are nicotine treatment programmes based on classical conditioning principles.

For example, **aversion therapy** uses **counterconditioning** to treat nicotine addiction by associating the pleasant effects of smoking with an aversive stimulus (e.g. painful electric shock). Some research studies have found this to be effective. For instance, James Smith's (1988) participants gave themselves aversive electric shocks whenever they engaged in any smoking-related behaviours. After one year, 52% of the participants were still abstaining, a much higher proportion than the 20–25% of people who continue not to smoke after deciding to give up.

Therefore treatments based on learning theory can save NHS resources, improve health and ultimately save lives.

Counterpoint However, this study did not use a **control (placebo) group**. The comparison made in the study (the proportion of people who continue not to smoke after deciding to give up) is not a valid measure of effectiveness. On this weak basis, many other treatments could claim to be more beneficial. There is also evidence from higher-quality studies that the benefits of aversion therapy are relatively short-lived, especially compared to other therapies (Hajek and Stead 2001).

This suggests that counterconditioning may not be an effective method of addiction treatment.

Evaluation eXtra

Animal research

It is reasonable to use non-human animals to study addiction in humans. One reason is that the conditioning mechanisms involved in nicotine addiction are the same in humans and other mammals (according to behaviourists). There are also **ethical** reasons why animals rather than humans are used in some addiction research.

However human-animal comparisons are flawed because nicotine addiction in humans is more complex than in rats. **Cognitive** factors influence learning processes in human addiction which means humans think about reinforcers in a way that other mammals do not. There are also ethical reasons not to use animals in addiction research.

Consider: *To what extent can non-human animal studies help us understand nicotine addiction in humans?*



Why do addicted smokers persist in their behaviour? Operant and classical conditioning together may offer an explanation.

Apply it Concepts — Can't stop, won't stop

Roxanne started smoking against her better judgement just over a year ago, mainly because her friends were all into it. She is now desperate to give up but finds it really hard. Although she knows smoking is damaging her health, there is a lot about it that she enjoys.

Question

Outline some of the pleasurable effects that Roxanne gets from smoking, and explain in terms of learning theory why she finds it so hard to stop.

Apply it Methods — Cues to addiction

A psychologist investigated the effects of cues on smoking behaviour. She selected a volunteer sample of smokers and non-smokers. The participants were asked to imagine in their own minds how they would go about smoking a cigarette, from unwrapping the packet to lighting up. They then had to rate how much they would like to smoke a cigarette at that moment, on a scale of 0 (not at all) to 10 (desperately).

Questions

1. Explain why the research method used in this study is a **quasi-experiment**. (*2 marks*)
2. Explain *one* strength and *one* limitation of this research method. (*2 marks + 2 marks*)
3. What is the **independent variable** in this study and how could you **operationally** define it? (*1 mark + 1 mark*)
4. The researchers conducted a **pilot study**. What is a pilot study and why might the researchers have thought one would be useful? (*2 marks*)
5. Explain how **demand characteristics** might have affected the study. (*2 marks*)

Check it

1. In relation to nicotine addiction, explain what is meant by 'cue reactivity'. *[2 marks]*
2. Briefly outline the learning theory explanation of nicotine addiction. *[4 marks]*
3. Describe **and** evaluate the learning theory explanation of smoking behaviour. *[16 marks]*

Explanations for gambling addiction: Learning theory

The specification says...

> Explanations for gambling addiction: learning theory as applied to gambling, including reference to partial and variable reinforcement.

The DSM-5 (2013) reclassified problem gambling as an addictive disorder because it shares many of the characteristics of substance addictions. It is currently the only addiction in the special category of behavioural addictions in the DSM-5.

Key terms

Reinforcement A consequence of behaviour that increases the likelihood of that behaviour being repeated. Can be positive or negative.

Partial reinforcement A behaviour is reinforced only some of the time it occurs (e.g. every tenth time or at variable intervals).

Variable reinforcement A type of partial reinforcement in which a behaviour is reinforced after an unpredictable period of time or number of responses.



The glamour surrounding some forms of gambling can act as a cue, triggering feelings of arousal and making relapse more likely.

Study tip

Students sometimes find that similar concepts can be confusing. For example, on this spread there are several concepts related to learning theory and they have quite a bit in common, including the same terminology – at least five different types of reinforcement! It's really important you're sure in your own mind about the differences between them – your answers will be a lot clearer. It's worth finding a way of distinguishing between concepts that works for you, even if that means using bizarre mental images of each one (how would you picture vicarious reinforcement?).

Learning theory of gambling addiction

Vicarious reinforcement

The first component of the **learning theory** of gambling addiction is **reinforcement** – in particular **vicarious reinforcement**. That is, the experience of seeing others being rewarded for their gambling through pleasure, enjoyment and occasionally money. This doesn't have to be direct observation of other people's behaviour – newspapers, magazines and other media report positively on big lottery winners, or broadcast the glamour and excitement of horse racing, for example. This may be enough to trigger a desire for the same reinforcement in someone who hasn't gambled before.

Direct positive and negative reinforcement

Once a person has started to gamble, there are two sources of direct **positive reinforcement**. Winning money is an obvious reinforcer of continued gambling, and the 'buzz' that accompanies a gamble is also reinforcing because it is exciting.

Gambling can also be an escape for many, albeit a temporary one. This is **negative reinforcement** to the extent that it offers a distraction from aversive stimuli such as the anxieties of everyday life.

Partial reinforcement

B.F. Skinner's research with rats (see page 10) and pigeons demonstrated that a *continuous reinforcement* schedule, which rewards every 'correct' response from the animal, does not lead to the most persistent behaviour. Under this schedule, once the rewards stop, the targeted behaviour quickly disappears (a process known as **extinction**). A **partial reinforcement** schedule, on the other hand, does create the kind of persistent behaviour that is seen in gambling. In some types of partial reinforcement (such as **variable reinforcement** below) only some bets are rewarded, so there is an unpredictability about which gambles will pay off. This is enough to maintain gambling even when most gambles are not rewarded.

Variable reinforcement

Under a variable reinforcement schedule, behaviour is reinforced intermittently. This produces the most persistent learning. A reward is given after an unpredictable number of responses. For example, a slot machine might pay out after an average of 8 spins, but not on *every* 8th spin. So the first payout might come after the 3rd spin, the next after the 4th, the next after the 12th, and so on.

It takes longer for learning to be established under this schedule, but once it is established it is much more resistant to extinction. It is possible to go for many spins with no payout at all, but the gambler continues to place wagers for a long time even when their behaviour is no longer reinforced. This helps to explain why some people continue to gamble despite big losses. The gambler learns that they will not win with every gamble, but they will eventually win if they persist.

Cue reactivity

Just as in the case of nicotine **addiction** (see previous spread), **cue reactivity** can explain how a behavioural addiction like gambling can be maintained and reinstated after relapse. Experienced gamblers encounter many **secondary reinforcers**, stimuli that become reinforcing because of their associations with exciting arousal.

Such reinforcers include the atmosphere of a betting shop, the colourful look of lottery scratchcards, a TV horse-racing channel, or the exciting sounds of internet betting sites. The presence of such secondary reinforcers can cue the arousal that the gambler craves, even before they place a bet.

These cues are everywhere in social and media environments, so they are difficult for the abstaining gambler to avoid. They offer continuous low-level reminders of the pleasures of gambling, and make relapse a fairly predictable outcome for many.

Apply it

Concepts

Horace and the horses

Horace's gambling addiction almost ruined his life, until he joined Gambler's Anonymous. He used to spend most of his income betting on horses, but he hasn't placed a bet for more than six months now. Unfortunately, his walk to work every morning takes him past a betting shop. He hasn't been inside it, but he has noticed that every time he goes past, he feels a little bit of the 'buzz' he used to get when he gambled.

Question

Explain how learning theory would account for Horace's experience.

Evaluation

Research support

One strength is support from research outside the lab situation.

Mark Dickerson (1979) observed the behaviour of gamblers in two betting offices in Birmingham. He compared gamblers who placed the most bets on horse races (high-frequency gamblers) with those who placed few bets (low-frequency). He found that the high-frequency gamblers were consistently more likely to place their bets in the last two minutes before the start of the race. Dickerson suggested that the reason for this difference is that all gamblers find the 'build-up' exciting regardless of the result, especially dependent gamblers (i.e. high-frequency ones). The excitement is rewarding and they may have delayed betting to prolong it.

This is evidence for the role of positive reinforcement in gambling in a real-world setting rather than in a lab.

Counterpoint However the study did have some methodological shortcomings. For instance, gambling behaviour was directly observed in the betting shops over a period of 14 weeks by one observer. Because there was a single observer there was no way of checking the reliability of the observations. The usual method is to have two observers and measure the agreement between them (**inter-observer reliability**) but this was not done in this study.

Therefore, observer bias was not eliminated and the findings of the study may not be valid.

Limited explanation

One limitation of learning theory is that it struggles to explain some types of gambling.

Learning theory can explain gambling addiction in games where there is almost no delay between placing the bet and knowing the outcome (e.g. fruit machines, scratchcards). But it is harder for learning theory to explain addiction to gambling in which the outcome is known some time after placing the bet (e.g. horse racing and most sports betting). This is because the reward (outcome) comes a long time after the behaviour (betting), so conditioning should be less effective.

Therefore, learning theory is limited because it does not provide a general explanation of all gambling addiction.

Explains failure to stop

Another strength of learning theory is it explains why most gamblers cannot stop gambling.

Learning theory not only explains why gambling addiction starts but also how it is maintained. Conditioning (learning) is an 'automatic' process. It does not require a gambler to make any active decisions. He or she is not even aware that they are learning to be addicted. So even though most addicted gamblers are extremely determined to give up, they fail over and over again. This may well be because their conscious desire to give up may conflict with the conditioning processes that drive them to continue gambling.

Therefore learning theory explains the common everyday experience of most addicted gamblers who find it hard to stop gambling.

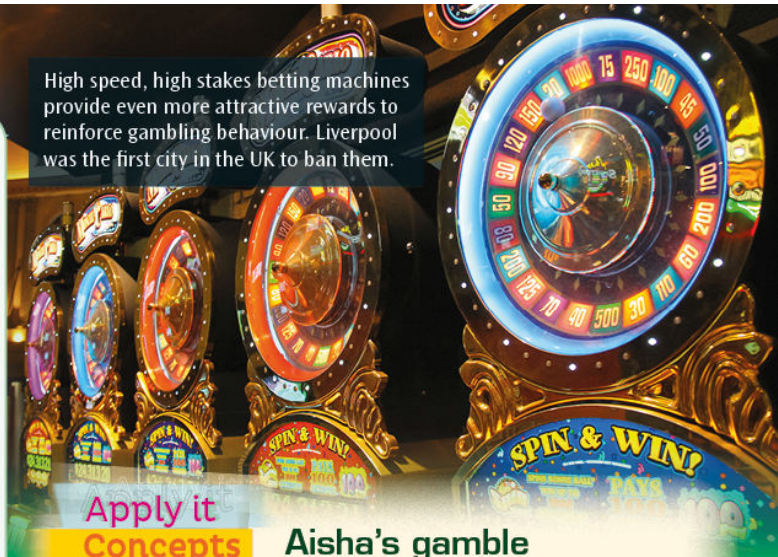
Evaluation eXtra

Cycle of addiction

Gambling addiction for many is a cycle of initiation, maintenance, cessation and relapse. Learning theorists believe they can explain the whole of this cycle. Addiction begins through vicarious reinforcement. Iain Brown (1987) suggests that reinforcement schedules explain the persistence of gambling addiction. Cue reactivity explains why so many addicted gamblers relapse after abstaining.

However, other psychologists believe parts of the cycle are poorly explained by learning theory. Brown suggests that learning theory actually struggles to explain how gambling addiction begins. After all, many people dabble with gambling and experience the same reinforcements as addicted people. This implies there may be other factors involved.

Consider: *Is learning theory a full explanation of the cycle of gambling addiction?*



High speed, high stakes betting machines provide even more attractive rewards to reinforce gambling behaviour. Liverpool was the first city in the UK to ban them.

Apply it Concepts — Aisha's gamble

Aisha is worried. She spends large sums of money which she can't afford on online fruit machines. She thinks that if it wasn't for gambling her life would be dull, boring and depressing. She spends so much time online that she hasn't seen her friends for weeks. But it's like she can't help herself. Every time she says she's going to give up, she finds herself back online.

Question

Use your knowledge of learning theory to explain why Aisha continues to gamble.

Apply it Methods — Place your bets

Two researchers carried out an observational study of gambling behaviour in a betting shop. They observed customers choosing runners and riders in horse races, placing bets, and following the progress of the race on TV. They were interested in whether there was any link between the number of bets placed by the customers and their level of excitement during races.

Questions

1. Suggest *three* **operationalised behavioural categories** the observers could use to measure level of excitement. (*3 marks*)
2. Explain what is meant by **time sampling** and **event sampling** in relation to this study. (*2 marks + 2 marks*)
3. The researchers had to choose one betting shop in which to conduct their study. Explain *one* factor that they should have taken into account in making their choice. (*2 marks*)
4. The researchers conducted a **pilot study**. What is a pilot study and why might the researchers have thought a pilot study would be useful? (*3 marks*)
5. The researchers found that **inter-observer reliability** was low in the pilot study. Explain what the researchers could have done to improve it before carrying out the main **observational study**. (*3 marks*)

Check it

1. In relation to learning theory of gambling addiction explain what is meant by 'partial reinforcement' **and** 'variable reinforcement'. *[2 marks + 2 marks]*
2. Explain **one** limitation of the learning theory of gambling addiction. *[4 marks]*
3. Outline the roles of partial **and** variable reinforcement in gambling addiction. *[6 marks]*
4. Discuss the learning theory explanation of gambling addiction. *[16 marks]*

Explanations for gambling addiction: Cognitive theory

The specification says...

> Explanations for gambling addiction: cognitive theory as applied to gambling, including reference to cognitive bias.

A common criticism of biological and learning theories of addiction is that they ignore the role of cognition, i.e. how we think, perceive and remember. These cognitive processes are assumed to be irrational and biased in people with a gambling addiction.

On this spread we look at three important cognitive processes that have been linked to different stages of gambling addiction: expectations, cognitive biases and self-efficacy.

Key term

Cognitive bias A distortion of attention, memory and thinking. It arises because of how we process information about the world, especially when we do it quickly. For instance, we recall memories that confirm our existing views and ignore others. This can sometimes lead to irrational judgements and poor decision-making.



Frequent gamblers often think of slot machines as if they have personalities ('this machine is just mean') – is this irrational?

Cognitive theory of gambling addiction

Expectations

Expectations are central to the initiation of gambling. We all have expectations about the future benefits and costs of our behaviour. People who take up gambling usually expect the benefits will outweigh the costs. But some people overestimate the benefits (e.g. the likelihood of winning) and underestimate the costs (e.g. financial losses).

They may also have unrealistic expectations about how gambling will help them cope with their emotions. For example, they expect that gambling will boost their positive moods (provide excitement) and reduce their negative moods (alleviate stress). People with these distorted expectations are more likely to become addicted.

Cognitive biases

Gamblers continue to gamble (and then become addicted) because they have **cognitive biases**, such as mistaken beliefs about luck. These biases influence how gamblers think about their behaviour, what they do and do not pay attention to, and what they remember and forget. For instance, a gambler who overestimates their chances of winning will ignore information that challenges this belief (e.g. true odds) and selectively remember whatever supports it (e.g. wins).

Debra Rickwood *et al.* (2010) classify cognitive biases into four categories:

1. *Skill and judgement* – addicted gamblers have an illusion of control which means they overestimate their ability to influence a random event (e.g. being especially skilled at choosing lottery numbers).
2. *Personal traits/ritual behaviours* – addicted gamblers believe that they have a greater **probability** of winning because they are especially lucky or they engaged in some superstitious behaviour (e.g. touching a certain item of clothing before placing a bet).
3. *Selective recall* – gamblers can remember the details of their wins but they forget, ignore or minimise their losses, which are often interpreted as unexplainable mysteries.
4. *Faulty perceptions* – addicted gamblers have distorted views about the operation of chance, exemplified in the so-called **gambler's fallacy**, the belief that a losing streak cannot last and must always be followed by a win.

Self-efficacy

Self-efficacy refers to the expectations we have about our ability to achieve a desired outcome, and is a key element in relapse. It is a cognitive process because it is based on expectations and perceptions. Relapse happens because the person has a biased belief that they are not capable of abstaining permanently (e.g. they believe they don't have the skills or motivation), so they expect to gamble again. This sets up a *self-fulfilling prophecy*, in which the individual behaves in a way that confirms this expectation ('You see, I told you I couldn't stop'), which is in turn **reinforced**.

Research into cognitive biases

Mark Griffiths (1994) investigated cognitive biases in gamblers.

Procedure He used the 'thinking aloud' method (a form of **introspection**) to compare the cognitive processes of regular slot machine gamblers and people who used the machines only occasionally. The participants had to verbalise any thoughts that passed through their minds as they played the machine. A **content analysis** classified these utterances into rational ('Wow, I won ten pence') or irrational ('This machine likes me'). A **semi-structured interview** was used to ask participants about the degree of skill required to win on slot machines. Behavioural measures recorded, for example, total winnings.

Findings Griffiths found that there were no differences between regular and occasional gamblers in objective behavioural measures (e.g. the regulars did not win more money). But regular gamblers did make almost six times as many irrational verbalisations than the occasionals (14% compared with 2.5%). They were particularly prone to an *illusion of control* ('I'm going to bluff this machine'). Finally, regular gamblers both overestimated the amount of skill required to win on slot machines and considered themselves to be especially skilful at doing so, compared with the occasional gamblers.

Apply it Concepts

No chance of winning

Sukarita plays the National Lottery every week. She never selects a lucky dip but very carefully chooses the numbers. She always gets a very strong feeling that this time she will win the jackpot, right up to the moment the lottery balls are drawn.

Sukarita also spends a lot of money on scratchcards. Every time she buys one she is convinced that by revealing the numbers in a certain order, she is bound to win.

Question

Explain Sukarita's gambling behaviour in terms of cognitive biases.

Practical activity on page 378

Evaluation

Research support

One strength of cognitive theory is support for the role of cognitive biases.

Rosanna Michalczuk *et al.* (2011) studied 30 addicted gamblers attending the National Problem Gambling Clinic in the UK, comparing them with 30 non-gambling **control** participants. The addicted gamblers showed **significantly** higher levels of gambling-related cognitive biases of all types (e.g. illusions of control). The gamblers were also more impulsive and were more likely to prefer immediate rewards even when the rewards were smaller than rewards they could gain if they waited. Because addicted gamblers make gambling decisions impulsively, they have a powerful tendency towards biased thinking during play.

These findings support the view that there is a strong cognitive component to gambling addiction.

Counterpoint In the study above cognitive biases were measured using the *Gambling-related cognitions scale* (GRCS). This scores respondents on five types of bias, such as illusion of control and the gamblers' fallacy. The score could mean that a gambler has frequent biased cognitions (which is what the researchers concluded). Alternatively the score might reflect a gambler's tendency to use their beliefs to justify their behaviour and therefore their thinking wasn't biased at all.

Therefore, the findings of the study may not reflect a gambler's actual beliefs about gambling.

Further research support

Another strength is further research support for cognitive biases.

George McCusker and Briege Gettings (1997) used a modified **Stroop task**. Participants had to identify as quickly as possible the ink colour in which words were printed. To do this, they had to pay attention to one thing (ink colour) while ignoring another (word meanings). Addicted gamblers took longer to perform this task than controls but only when the words related to gambling. They were unable to prevent the word meanings from interfering with the intended task.

This suggests that gamblers have a cognitive bias to pay attention to gambling-related information that does not exist in non-gamblers.

Methodological problem

One limitation is the use of 'thinking aloud' in research.

This self-report method is used a lot in studies to access the cognitive biases of addicted gamblers (including Griffiths on facing page). However, according to Mark Dickerson and John O'Connor (2006) what people say in gambling situations does not necessarily represent what they really think. Frivolous or off-the-cuff remarks during a slot machine session may not reflect an addicted gambler's deeply-held beliefs about chance and skill. Researchers may instead get a misleading impression that gamblers' thought processes are irrational when they are not.

Therefore, findings may not be valid because gamblers' utterances do not express their genuine beliefs.

Evaluation eXtra

The true explanation?

Cognitive theory is the true explanation because cognitive biases (e.g. illusion of control) can explain how gambling behaviour becomes gambling addiction. There is evidence on this spread that people addicted to gambling process information differently from non-gamblers (e.g. McCusker and Gettings).

However, an alternative view suggests that cognitive biases do not truly explain gambling addiction because they are only **proximate** causes. We have to go further back in the chain of causation to find the **ultimate** explanation, which may be biological (e.g. neurochemistry).

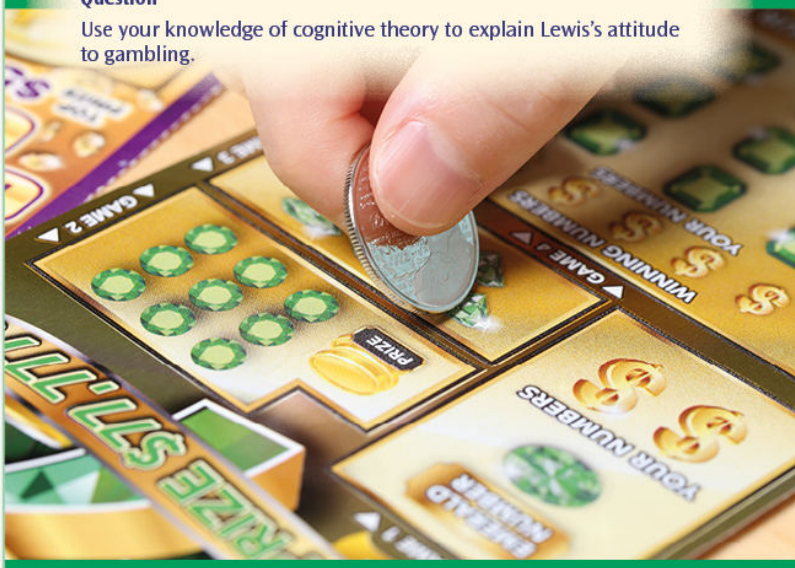
Consider: *Does cognitive theory truly explain gambling addiction?*

Apply it Concepts — Lucky Lewis?

Lewis spends a lot of time feeding coins into slot machines. He gets the occasional payout, but is spending a lot more money than he wins. He can go for dozens of 'spins' without any success at all, but he knows that Lady Luck has a way of balancing things out. One day, he will get a big win, he thinks.

Question

Use your knowledge of cognitive theory to explain Lewis's attitude to gambling.



Can you control the numbers? Some addicted gamblers demonstrate the kind of distorted thinking which suggests they can.

Apply it Methods — Word play

A psychologist carried out a laboratory experiment with frequent gamblers. She wanted to see if they were better at recalling words that were gambling-related or non-gambling-related. The participants learned two lists of words – one contained words such as 'bets', 'odds' and 'races'. The other contained more neutral words such as 'desk' and 'apple'. For each list, they had to recall as many words as they could remember.

Questions

1. Name the **experimental design** used in this study. (*1 mark*)
2. The psychologist realised that she would need to use **counterbalancing**. Explain how she could have done this, and why it was necessary. (*4 marks*)
3. Explain how *one* factor in this study might have affected its **external validity**. (*3 marks*)
4. Identify an appropriate **statistical test** the researcher could use to analyse the data. (*1 mark*)
5. Give *two* reasons why this would be an appropriate test to use. (*2 marks*)

Check it

1. In relation to cognitive theory of gambling addiction, explain what is meant by 'cognitive bias'. *[2 marks]*
2. Explain the role of cognitive bias in gambling addiction. *[4 marks]*
3. Describe **and** evaluate the cognitive theory of gambling addiction. *[16 marks]*

Reducing addiction: Drug therapy

The specification says...

Reducing addiction: drug therapy.

Beginning with this spread, we now look at ways in which addictions to substances and behaviours can be treated – starting with drug therapy. The view that addictions can best be explained in terms of neurochemical factors within the brain, or by genetic influences, has naturally led to the development of a biological treatment that tackles these physical causes. Drug therapy has been used for decades, with varying degrees of success.

Key term

Drug therapy Treatment involving drugs, i.e. chemicals that have a particular effect on the functioning of the brain or some other body system. In the case of psychological disorders such drugs usually affect neurotransmitter levels.

Study tip

Here are two pieces of advice to consider when writing about drug therapy.

First, it's very tempting to 'set the scene' by explaining the biology of addiction (e.g. the neurochemistry of nicotine addiction). But remember that your focus must be on treating addiction, not on how it develops in the first place.

Second, there has to be some biological content in your answer. The more you can explain the neurochemistry of drug therapy, the better your answer will be (and that ideally means using the right technical terms as well).



Transdermal nicotine patches are an increasingly popular method of giving up smoking, and evidence suggests they are effective.

Drug therapy for addiction

Three types of drug therapy

There are three main types of drug therapy for addiction: aversives, agonists and antagonists. They all work by changing how the person experiences the drug of addiction.

Aversives The main effect of aversives is to produce unpleasant consequences such as vomiting. For example, *disulfiram* is a **drug therapy** used to treat alcoholism by creating hypersensitivity to alcohol. If a person has taken *disulfiram* and then an alcoholic drink, within about five minutes the effects of a severe hangover (especially nausea) are felt. A client associates drinking alcohol with these unpleasant outcomes rather than with enjoyment (**classical conditioning**).

Agonists These are effectively drug ('substance') substitutes. They activate **neuron** receptors, providing a similar effect to the addictive substance. Agonists such as *methadone*, used to treat heroin **addiction**, satisfy the addicted person's craving for a state of euphoria. But they have fewer harmful side effects and are 'cleaner' because they are administered medically rather than dealt on the streets. Agonists stabilise the individual because they are used to control the **withdrawal syndrome**, allowing a gradual reduction in dose and symptoms.

Antagonists They treat addiction by blocking receptor sites so that the substance of **dependence** cannot have its usual effects, especially the feeling of euphoria that people with addictions crave. *Naltrexone* is an opioid antagonist used to treat the physiological dependence of heroin addiction. However, other interventions (such as **counselling**) should be used alongside the drug therapy to tackle the psychosocial causes of the addiction.

Drug therapy for nicotine addiction

Nicotine replacement therapy (NRT) uses gum, inhalers or patches to deliver the psychoactive substance in tobacco smoke but in a less harmful fashion. Nicotine is the major addictive chemical in tobacco, but it is not the most harmful to health.

NRT provides the user with a clean, controlled dose of nicotine which operates neurochemically as an agonist which activates nicotinic **acetylcholine** receptors (nAChRs) in the **mesolimbic pathway** of the brain. This stimulates release of **dopamine** in the **nucleus accumbens**, just as it does in smoking (see page 360). Using NRT means that the amount of nicotine can be reduced over time by using smaller and smaller patches, for example. So the withdrawal syndrome can be managed over a period of two or three months, reducing the unpleasantness of withdrawal symptoms.

Drug therapy for gambling addiction

There are no drugs currently officially approved to treat gambling addiction. There is ongoing research into several candidates, the most promising being opioid antagonists such as *naltrexone* which is conventionally used to treat heroin addiction. This has come about because of the similarities between gambling and substance addiction that are now recognised in DSM-5.

The neurochemical explanation of gambling addiction is that it taps into the same dopamine reward system as heroin, nicotine and other drugs. Opioid antagonists enhance the release of the **neurotransmitter GABA** in the mesolimbic pathway. Increased GABA activity reduces the release of dopamine in the nucleus accumbens (and ultimately the **frontal cortex**). This has been linked in some research (e.g. Kim *et al.* 2001) with subsequent reductions in gambling behaviour.

Apply it

Concepts

Patch it up

There's no question that Joni is addicted to cigarettes. She has been smoking since starting sixth form and is now on to at least two packs a day. It's costing her a fortune and her health is suffering. A friend explained how nicotine patches have helped him to cut right down, so Joni has decided to give them a go.

Question

Explain the benefits to Joni of nicotine replacement therapy. How does it work? Are there any drawbacks?

Evaluation

Research support

One strength of drug therapy is that research shows it is effective.

Jamie Hartmann-Boyce *et al.* (2018) conducted a **meta-analysis** of 136 high-quality research studies into the effectiveness of NRT (almost 65,000 participants). They concluded that all forms of NRT were **significantly** more effective in helping smokers quit than both **placebo** and no therapy at all. NRT products increased the rate of quitting by up to 60%. The research also indicated that NRT does not appear to foster dependence.

Therefore NRT is an effective therapy which may save lives and reduce costs to the NHS.

Counterpoint The researchers only included in their analysis research studies that had been published. There is a risk of **publication bias** because published studies are more likely to show 'positive' results. Studies with non-significant results or that show no effect are not usually published. The researchers note that they wrote to manufacturers of NRT producers to track down unpublished studies but 'the response was poor'.

This means that NRT may not be as effective as the findings of this meta-analysis suggest.

Side effects

One limitation of all drug therapies is that they have side effects.

The risk of side effects is that a client will discontinue the therapy. In the case of NRT the common side effects include sleep disturbances, gastrointestinal problems, dizziness and headaches. Side effects are a much greater concern in drug therapies for gambling addiction. This is because the dose required for *naltrexone* to have an effect on gambling behaviour is much higher than when it is used to treat opiate addiction. This means the side effects are correspondingly worse and include muscle spasms, anxiety and depression.

Therefore side effects should be weighed up against the benefits of the drug therapy and the costs/benefits of other therapies (e.g. psychological therapies).

Reduces stigma

Another strength of drug therapy is that addiction becomes less stigmatised through its association with drug therapies.

Many people hold the opinion that addiction is a psychological weakness. Even if the start of an addiction is the responsibility of the individual, it soon spirals out of their control. The stigma attached to addiction can lead to self-blame and depression, making recovery more difficult. But stigma is gradually being eroded by the continuing successful use of drug therapy, which encourages the perception that drug addiction has a neurochemical basis.

Therefore, it could be argued that perceiving addiction as something that can be treated with drugs helps people with addictions avoid self-blame and assists recovery.

Evaluation eXtra

Costs and benefits

There are potentially serious costs to using drugs to treat addiction. For example, as you have seen above, side effects are a cost. It is also true that drugs do not actually offer a cure but instead suppress cravings/symptoms or provide a substitute.

On the other hand drugs have some benefits in treating addiction. They control unpleasant withdrawal symptoms. Even side effects may be tolerable if the drug helps treat the addiction. Also, as you saw in drug therapies for OCD in Year 1, drugs are cost-effective and non-disruptive to people's lives.

Consider: *Do the benefits outweigh the costs or vice versa?*

Apply it Concepts — Taking a punt on drugs

Saul has finally recognised that his addiction to online poker has ruined his life. He has decided to get help, and has heard that there may be a drug he can take to reduce his gambling and the cravings he has for it. However, he is a bit concerned that there might be side effects and wants to know how useful the treatment will be.

Question

Explain how drug therapy could help reduce Saul's gambling addiction. As part of your explanation, consider both the strengths and limitations of such treatment.



A drug to reduce gambling addiction? It seems unlikely, but research is promising. But is it more effective than the alternatives?

Apply it Methods — Gambling case study

A researcher was interested in the effectiveness of a drug to treat gambling addiction. She conducted a case study of a man with a gambling addiction who was receiving treatment with the opioid antagonist *naltrexone*. She used various techniques to assess whether or not the treatment was effective for this individual.

Questions

1. Describe *one* technique that the researcher could have used to collect data in this **case study**. (*2 marks*)
2. Explain *one* strength and *one* limitation of conducting a case study. (*2 marks + 2 marks*)
3. Identify *two* variables that the researcher could measure to establish the effectiveness of the drug. (*2 marks*)
4. The researcher wrote up the case study in a report for publication in a scientific journal. What is the purpose of the discussion section of such a report? (*2 marks*)
5. A friend of the researcher thought the research was pointless. He believes that people become addicted because they are weak and giving them drugs will just make things worse. Explain why the friend's personal opinion is no substitute for scientific evidence. (*4 marks*)

Check it

1. Outline drug therapy as a way of reducing addiction. *[6 marks]*
2. Explain **one** limitation of using drug therapy to treat addiction. *[4 marks]*
3. Discuss drug therapy as a way of reducing addiction. *[16 marks]*

Reducing addiction: Behavioural interventions

The specification says...

Reducing addiction: behavioural interventions, including aversion therapy and covert sensitisation.

Many people who are addicted to a substance or behaviour experience serious negative consequences of their addiction, including health problems, relationship breakdown, job loss, trouble with the law, and many more besides. None of these negative consequences are enough to prevent most people continuing with their addictive behaviour. One reason is that these consequences usually happen a long time after the addictive behaviour has taken place.

On this spread, two behavioural interventions for reducing addiction are discussed. They operate by reducing the time lag between the desired effects of a substance/behaviour and its negative consequences so that they occur more-or-less together.

Key terms

Behavioural interventions Any treatment based on behaviourist principles of learning such as classical and operant conditioning.

Aversion therapy A behavioural treatment based on classical conditioning. A maladaptive behaviour is paired with an unpleasant stimulus such as a painful electric shock. Eventually, the behaviour is associated with pain without the shock being used.

Covert sensitisation A form of aversion therapy based on classical conditioning. A client imagines an unpleasant stimulus and associates this with a maladapive behaviour (in contrast with aversion therapy where the unpleasant stimulus is actually experienced).

The indignity of induced vomiting is one of the ethical issues raised by aversion therapy.



Aversion therapy

Aversion therapy is a **behavioural intervention** for addiction based on **classical conditioning**. The principle is that an addiction can develop through repeated associations between a substance/behaviour and the pleasurable state of arousal caused by it. Therefore it follows that the **addiction** can be reduced by exploiting the same classical conditioning process, but by associating the substance/behaviour with an unpleasant state (**counterconditioning**).

Aversion therapy for alcohol addiction

Aversion therapy has been extensively used in treating alcoholism. A client is given an aversive drug such as *disulfiram* (e.g. Antabuse). This interferes with the normal bodily process of metabolising alcohol into harmless chemicals. This means that someone who drinks alcohol while taking *disulfiram* will experience severe nausea and vomiting – effectively an instant hangover.

The aim of treatment is for a client to learn a new association. In classical conditioning terms, *disulfiram* and alcohol separately do not produce nausea/vomiting but together they do. So, through association, they become **conditioned stimuli** (CSs) producing an expectation of nausea/vomiting (a **conditioned response**, CR).

The client soon expects to experience the CR when they drink, and this is usually enough to prevent drinking.

Aversion therapy for gambling addiction

Other forms of aversion therapy associate an electric shock with the addiction. This has proved useful in treatment of behavioural addictions (e.g. gambling) and for people whose medical conditions (e.g. high blood pressure) might be worsened by frequent vomiting. The shocks used do not cause permanent damage but they are painful (because they are meant to be aversive).

An addicted gambler thinks of phrases that relate to their gambling behaviour and writes them down on cards. Some non-gambling behaviours are also included (such as 'Went straight home'). The client reads out each card. When they get to a gambling-related phrase they are given a two-second electric shock via a device attached to their wrist. The intensity and duration of the shock are preselected by the client (it should be painful but not distressing).

After repeated pairings, the pain (unconditioned response, UCR) becomes associated with gambling-related behaviours (was neutral stimulus, now conditioned stimulus), the client's cravings subside and they stop gambling.

Covert sensitisation

Traditional aversion therapy was a popular treatment for substance addictions in the 1960s and 1970s. It has been superseded by other treatments such as **covert sensitisation** which is also based on classical conditioning. This is a type of aversion therapy but occurs *in vitro* rather than *in vivo* (i.e. actual experience). That is, rather than actually experiencing the unpleasant stimulus of an electric shock or vomiting, the client *imagines* how it would feel.

Covert sensitisation in practice

The client is first of all encouraged to relax. The therapist then reads from a script instructing the client to imagine an aversive situation. The client sees themselves smoking a cigarette, followed by imagining the most unpleasant consequences, such as the feeling of nausea and the experience of vomiting. The more vivid this imaginary scene the better, which is why the therapist goes into graphic detail about the elements of the imagery including the sights, smells, sounds and physical movements involved.

One unpleasant technique is for the client to imagine being forced to smoke cigarettes covered in faeces. Sometimes, for added unpleasantness, the therapy will incorporate aversive stimuli chosen by the client. For example, Mary McMurran (1994) reports a habitual user of slot machines who had a phobia of snakes. The imaginative scenario involved him picturing a slot machine paying out its winnings not in cash but in writhing snakes. Towards the end of a session, the client then imagines a scene in which they 'turn their back' on cigarettes and experience the resulting feelings of relief.

Apply it

Concepts

Aversion advice

Krystof is a long-term heavy smoker. He has tried all sorts of treatments including nicotine patches, gum, and inhalers but nothing has worked. He is smoking more than ever and is now desperate. He has heard of a treatment where you're given a drug that induces vomiting. Krystof doesn't much like the sound of it, but is so desperate he's prepared to give it a go.

Question

Imagine Krystof is a friend of yours who asks you for some advice. Based on your knowledge of aversion therapy, explain why you would or would not recommend that he tries this treatment.

Evaluation

Methodological problems

One limitation is that studies of aversion therapy have methodological problems.

Peter Hajek and Lindsay Stead (2001) reviewed 25 studies of aversion therapy for nicotine addiction. They concluded it was impossible to judge the effectiveness of aversion therapy because most of the studies had 'glaring' methodological problems. For example, there was a failure to 'blind' the procedures, so the researchers knew which participants received therapy or placebo. This may have influenced the researchers' judgements of the therapy's success.

Therefore, this research may tell us little about the value of aversion therapy.

Poor long-term effectiveness

Another limitation of aversion therapy is its lack of long-term benefits.

Richard Fuller *et al.* (1986) gave one group of participants who were addicted to alcohol *disulfiram* every day for one year. Another group received a **placebo**. Both groups also had weekly counselling sessions for six months. There was no **significant** difference in total abstinence from drinking between these groups after one year.

This suggests that aversion therapy for alcohol addiction is no more effective than placebo – which may be because counselling had a bigger impact.

Evaluation eXtra

Ethical issues

Aversion therapy is unethical because it uses punishment to treat addiction. This explains why drop-out rates are so high. Aversion therapy may also cause physical and/or psychological harm. It might be thought an ethical treatment if it was effective.

On the other hand, aversion therapy can be considered ethical. Addiction to drugs and gambling is itself potentially dangerous to physical and psychological health whereas aversion therapy isn't so much. Self-selected small electric shocks may be painful but not life-threatening. It is unethical *not* to use aversion therapy.

Consider: *Is aversion therapy for addiction ethical?*

Evaluation

Research support

One strength is that there is research support for covert sensitisation.

Nathaniel McConaghy *et al.* (1983) compared covert sensitisation and electric shock aversion therapy for gambling addiction. After one year, those with covert sensitisation were significantly more likely to have reduced their gambling (90% of covert sensitisation participants compared with just 30% undergoing aversion). Covert sensitisation participants also reported experiencing fewer and less intense gambling cravings.

This suggests that covert sensitisation is a highly promising behavioural intervention.

Methodological criticism

One limitation is that many studies of covert sensitisation (including McConaghy *et al.* above) do not include a suitable comparison group.

For example, such studies often omit non-behavioural therapies as a comparison group. Instead they just compare covert sensitisation with aversion therapy. Addiction has many non-learning causes (such as cognitive factors). Non-behavioural therapies (such as CBT) address these whereas neither covert sensitisation nor aversion therapy do.

This means that the benefits of covert sensitisation may be exaggerated.

Evaluation eXtra

Symptom substitution

Covert sensitisation (like aversion therapy) only suppresses addiction, it is not a cure. People undergoing covert sensitisation may appear to recover but the issues that caused the addiction remain and then new symptoms appear (= symptom substitution).

However, the whole point of behavioural interventions is to change behaviour – the behaviour *is* the addiction. If symptoms arise to replace the ones that have disappeared then covert sensitisation could be used to treat those as well.

Consider: *How useful is covert sensitisation in treating addictions?*



Covert sensitisation is a much less traumatic experience than aversion therapy, with the client only imagining vomiting rather than actually experiencing it.

Apply it
Concepts

Gambling on a cure

Tamara gambles a lot on all sorts of different games, including the lottery, scratchcards, horse racing, poker, and slot machines. She enjoys the thrill and isn't all that bothered about winning, although she worries her hobby is becoming an addiction and wonders if she should do something about it.

Question

Choose *one* of these forms of gambling and explain how covert sensitisation could be used to help Tamara.

Apply it
Methods

Reducing the urge

A psychologist interviewed 65 gambling addicts one month after they underwent covert sensitisation treatment. On the basis of questions related to gambling urges and cravings, she assessed their severity of gambling urges in the preceding month and placed each participant into one of four categories: urges absent (19 participants), urges markedly reduced (25), urges slightly reduced (13), urges unchanged (8).

Questions

1. Explain *two* differences between a **structured** and an **unstructured interview**. (*2 marks* + *2 marks*)
2. Explain *one* reason why the psychologist thought interviews might be better than **questionnaires** in this study. (*2 marks*)
3. Write *one* example of an **open question** that the psychologist could have asked. (*2 marks*)
4. Calculate the proportions of participants in each outcome category as percentages (*four* percentages). (4 marks)
5. Identify *one* issue of **reliability** in this study and explain how the psychologist could have improved it. (*1 mark* + *2 marks*)

Check it

1. Explain what is meant by 'behavioural interventions' in relation to reducing addiction. *[2 marks]*
2. Outline covert sensitisation as a behavioural intervention for reducing addiction. *[4 marks]*
3. Outline aversion therapy as a behavioural intervention for reducing addiction. *[4 marks]*
4. Discuss **one or more** behavioural interventions for reducing addiction. *[16 marks]*

Reducing addiction: Cognitive behaviour therapy

The specification says...

Reducing addiction: cognitive behaviour therapy.

Addictions may begin or be maintained because of the ways people *think* about their behaviour. Alongside this, addicted people may lack the skills they need to overcome their addiction. On this spread, we look at how cognitive behaviour therapy addresses all of these concerns.

Key term

Cognitive behaviour therapy (CBT) A method for treating mental disorders based on both cognitive and behavioural techniques. From the cognitive viewpoint the therapy aims to deal with thinking, such as challenging negative thoughts. The therapy also includes behavioural techniques.



Functional analysis in CBT helps a client to understand the reasons why they use drugs or behave in certain ways.

Cognitive behaviour therapy for addiction

Cognitive behaviour therapy (CBT) aims to change the maladaptive ways of thinking and behaving associated with substance or behavioural **addictions**. There are two indispensable elements to a CBT programme. First, a *functional analysis* identifies the cognitive biases that underlie addictions, replacing the cognitive biases with more adaptive ways of thinking (cognitive element). Second, *skills training* helps a client to develop coping *behaviours* to avoid the high-risk situations that usually maintain addictions or trigger relapse (behavioural element).

1. Cognitive – Functional analysis

CBT starts with a client and therapist together identifying the high-risk situations in which the client is likely to gamble or use a substance of addiction. The therapist reflects on what the client is thinking before, during and after such a situation. The quality of the client–therapist relationship is therefore critical. It should be warm, collaborative and responsive, but not cosy. This is because the therapist must challenge the client's biased cognitions and not merely accept them.

Cognitive restructuring All CBT programmes aim to change a client's addiction-related cognitive biases. So in gambling addiction, restructuring addresses the client's faulty beliefs about, for example, probability, randomness, control, gains and losses. These are confronted and challenged by the therapist. There is an initial educational element, in which the therapist might give the client information about the nature of chance.

The functional analysis is an ongoing process. In the early phases of therapy it helps a client identify the triggers for their addiction, a necessary starting point. But it is useful later as well, in helping a client to work out the circumstances in which he or she is still having problems with coping, and what further skills training may be needed.

2. Behavioural – Skills training

Most people who seek therapy for addiction usually have a huge range of problems but only one way of coping with them – their addiction. CBT helps the client to replace this strategy with more constructive ones. CBT is a very flexible therapy, so the therapist will be able to call upon a wide range of skills training techniques, starting with the basics and moving on to more individually tailored methods such as social skills training.

Specific skills CBT is a 'broad-spectrum' treatment because it focuses on wider aspects of a client's life that are related to his or her addiction. For example, the functional analysis may reveal that a client lacks specific skills to allow him or her to cope with situations that trigger alcohol use. *Assertiveness training* could be used to help a client confront interpersonal conflicts in a controlled and rational way instead of using avoidance, manipulation or aggression. **Anger management** training can help some clients to cope with the situations that make them angry enough to resort to drinking.

Social skills Most clients can benefit from learning skills that help them to cope with social situations. For example, a recovering alcoholic will find themselves in situations where alcohol is available (e.g. weddings, parties). *Social skills training* (SST) will help them to learn how to refuse alcohol with minimum fuss in ways that avoid embarrassment, for example by making appropriate eye contact and being firm in refusing an offer of a drink.

Whatever skills training methods are used, a therapist might begin with an explanation of the reasoning behind learning a new skill. Perhaps a lack of that skill was identified in the functional analysis as the reason why the client relapsed during the week. The therapist then explains how the skill is performed, but crucially he or she models the behaviour which the client then imitates in **role play**. The skills training element of CBT is therefore usually highly directive, with constant 'tell and show' by the therapist with the client initially imitating the therapist's performance before eventually using the skill on their own in high-risk situations.

Apply it Concepts

Give it up!

Cecilia wants to go on a big holiday next year with her friends and she reckons she could save some money if only she could give up smoking. She has tried on and off over the years, but nothing has worked, not even the nicotine patches that seem to succeed for everyone else. She rang a 'quit smoking' helpline and they suggested that Cecilia goes to see her GP to find out about cognitive behaviour therapy.

Question

Using your knowledge of CBT, describe the sorts of procedures and techniques that Cecilia can expect to experience. Explain how they specifically apply to her smoking addiction.

Evaluation

Short term only

One limitation of CBT is that it may only be effective in the short term.

Sean Cowlishaw *et al.* (2012) conducted a **meta-analysis** of 11 studies comparing CBT for gambling addiction with **control** conditions. The analysis showed that CBT had medium to very large effects in reducing gambling behaviour for periods of up to three months after treatment. But after nine to 12 months, there were no **significant** differences in outcome between the CBT and control groups. The studies may even have overestimated the benefits of CBT because they were of such poor quality.

Therefore, the research picture for CBT is one of short-term benefit but long-term disappointment.

Counterpoint However, there is some high-quality research that challenges the above conclusion. Nancy Petry *et al.* (2006) **randomly allocated** pathological gamblers to either a control group (Gamblers Anonymous meetings) or a treatment condition (GA meetings plus an eight-session individual CBT programme). The treatment clients were gambling significantly less than the control participants 12 months later. This study has high **internal validity** because of the random allocation and also there were no significant differences in the extent of their gambling at the start.

Therefore, this one study (which was methodologically better) suggests that CBT is effective in reducing gambling addiction beyond the short term.

High drop out

Another limitation is that many clients drop out of CBT.

Pim Cuijpers *et al.* (2008) note that drop-out rates in CBT treatment groups can be up to five times greater than for other forms of therapy. This may be because CBT is a demanding therapy. In addition, clients often seek CBT initially because some life crisis caused by their addiction has driven them into therapy. Once the crisis is resolved, or doesn't loom as large in their lives, these clients often give up therapy.

The high drop-out rate is a major obstacle to success of CBT in reducing addictions.

Relapse prevention

One strength of CBT is it is especially useful in preventing relapse.

Most people's experience of addiction is one of repeated relapse. CBT presents a very realistic view of recovery and incorporates the likelihood of relapse into treatment. Relapse is viewed as an opportunity for further cognitive restructuring and learning rather than as a failure. It is an inevitable part of an addicted person's life, but manageable as long as his or her psychosocial functioning improves.

Therefore, when clients stick with the therapy, CBT can help them to avoid relapse by maintaining a stable lifestyle.

Evaluation eXtra

Do we need the C in CBT?

CBT proposes that it is important to target both cognitions and behaviours to successfully treat addictions. In fact behavioural interventions (the topic of the previous spread) may work partly because of their effect on changing cognitions. Changing cognitions may also avoid the risk of symptom substitution.

On the other hand, CBT could treat addictions by focusing just on behaviour (and drop the cognitive element). For example, we saw on the previous spread that covert sensitisation is a successful treatment that targets behaviour only. Changing cognitions can also be counterproductive because it is the most demanding aspect of CBT.

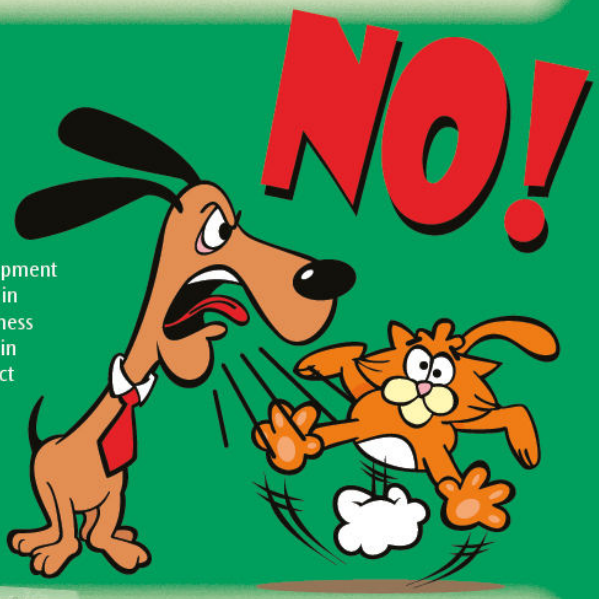
Consider: *Is it necessary for CBT to address cognitions?*

Apply it Concepts — Hugo needs help

Hugo uses alcohol to cope with the pressures of everyday life. He frequently drinks to excess, even during the week, often going to work with a hangover or still drunk. He finally acknowledged he needed help when he woke up lying in a gutter in the street at four in the morning. He knows there are many different treatments available, but he's not sure which one is going to help him the most.

Question

Imagine you are Hugo's friend. You are familiar with how CBT works as a treatment for alcohol addiction. Considering both its strengths and limitations, outline the advice you would give to Hugo.



One skill development technique used in CBT is assertiveness training, useful in helping an addict to refuse drugs.

Apply it Methods — Assessing CBT

A psychologist decided to investigate the effectiveness of CBT for cocaine addiction. He selected a group of cocaine users who were following a ten-session CBT programme and compared their progress with that of a control group. He used a rating scale from 1 (no progress) to 10 (excellent progress).

Questions

1. Explain what is meant by a **control group**. (*2 marks*)
2. Identify an appropriate control group for this study and explain why it is suitable. (*2 marks*)
3. Explain *one* **ethical issue** the researcher might have encountered in this study, and *one* way in which he could have dealt with it. (*2 marks + 2 marks*)
4. Identify a suitable **statistical test** to analyse the difference between the CBT and control groups at the end of the study. (*1 mark*)
5. The psychologist used this test to analyse the difference between the CBT and control groups. He found there was a significant difference at $p \leq 0.05$. Explain what this statement means. (*2 marks*)

Check it

1. Describe cognitive behaviour therapy as a treatment for reducing addiction. *[6 marks]*
2. Briefly outline how cognitive behaviour therapy (CBT) is used to reduce addiction and explain **one** limitation of using CBT to reduce addiction. *[4 marks]*
3. Describe **and** evaluate cognitive behaviour therapy as a treatment for reducing addiction. *[16 marks]*

Applying theories of behaviour change to addiction: Theory of planned behaviour

The specification says...

The application of the following theories of behaviour change to addictive behaviour; the theory of planned behaviour.

'Easy is the descent into Hell, for it is paved with good intentions.' (Milton, *Paradise Lost*)

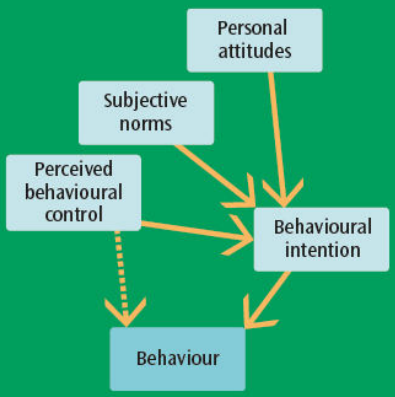
Did you make any New Year's resolutions this year? When we make such resolutions most of us really and truly believe in them, our intentions are completely sincere. But they usually come to nothing.

Psychologists have tried to understand this link (or lack of one) between our intentions and the reality of our actual behaviour.

Key term

Theory of planned behaviour (TPB) Changes in behaviour can be predicted from our intention to change, which in turn is the outcome of personal attitudes towards the behaviour in question, our beliefs about what others think, and our perceived ability to control our behaviour.

In the text we've illustrated the TPB using gambling as an example of an addiction. But of course the theory can also be applied to other forms of addiction including those not in the specification such as heroin, alcohol, etc.



The theory of planned behaviour

I intend to stop gambling because I believe gambling has negative outcomes for me (personal attitudes), I perceive that my family and friends disapprove (subjective norms) and I believe I have the ability to stop (perceived behavioural control). Therefore I will put time and effort into stopping (behaviour).

Theory of planned behaviour applied to addiction

The **theory of planned behaviour** (TPB) was formulated by Icek Ajzen (1985, 1991). It is a theory of how we can change our behaviour deliberately through rational decisions – we evaluate the positive and negative consequences. The TPB asserts that therefore our behaviour can be predicted from our *intentions*. Applied to addiction, the TPB aims to link intentions (decisions, for example, to take drugs or give them up) with actual changes in behaviour.

The TPB suggests our intentions to use (and give up) drugs arise from three key influences: our personal attitudes, subjective norms and perceived behavioural control.

1. Personal attitudes

An addicted person's attitudes are a combination of favourable and unfavourable opinions about their addiction. Personal attitudes are formed by the person evaluating the positive and negative consequences of their addiction-related behaviour. For example, attitudes towards gambling will be favourable if the person believes the outcomes associated with gambling are positive.

Attitudes may become unfavourable and that will lead to reduced interest in addiction-related behaviour. For example, an addicted gambler may learn to associate gambling with outcomes such as, 'I lose more money than I win, I'm trapped, it makes me anxious, it stops me doing other things'. A gambler who evaluates outcomes in this way will likely form an *intention* to gamble less.

2. Subjective norms

Subjective norms are the addicted person's beliefs about whether those who matter most to them approve or disapprove of their addictive behaviour. The beliefs are based on what an addicted person believes to be 'normal' behaviour (i.e. norms). The addicted person considers what their friends and family would think if they knew about their addiction. In this case of gambling, for example, this entails thinking about their friends' and family's own behaviour – do they gamble at all, and how much? And also their attitudes – have they expressed any views about gambling, favourable or unfavourable? The addicted person might conclude: 'I believe that most people who matter to me would be very unhappy with me gambling like this'. This would lead them to form an *intention* not to gamble, and therefore make them less likely to actually gamble.

Application A person's addiction-related intentions and behaviours can be altered by changing their subjective norms. For example, adolescents often overestimate the extent of substance abuse in their peer group. This may influence their own behaviour as they try to keep up with the perceived norm (peer influences are one of the risk factors we looked at on page 358). Many campaigns against substance abuse (e.g. *Talk to Frank*) combat this by providing messages that reveal the true extent of substance abuse (i.e. it's only a minority). The source of the message has to be credible, because our subjective norms are most influenced by the views of people we respect.

3. Perceived behavioural control

This is about how much control we *believe* we have over our behaviour, i.e. **self-efficacy**. Does an addicted gambler believe that giving up gambling is an easy or difficult thing for them to do? This depends on their perception of the resources available to them, both external (time, support) and internal (ability, effort).

According to the TPB, perceived behavioural control has two possible effects. First, it can influence our behaviour indirectly via our *intentions* to behave, so that the more control I believe I have over my ability to stop gambling, the stronger my intention to do so. Second, this is the only one of the three TPB components that can influence behaviour *directly*, so the greater my perceived control over my gambling, the longer and harder I will try to stop.

Application Increasing an addicted gambler's self-efficacy could help them quit and/or avoid relapse. This can be done by encouraging an optimistic outlook and confidence in their ability not to gamble. They should also be aware that quitting and abstaining require effort ('willpower'). Other resources can also help develop perceived control, such as support from other people.

Apply it Concepts

Why, why, why, Delilah?

After years of her friends and family cajoling her, Delilah has finally decided to stop smoking. Nobody else she knows well smokes, and they're not shy about telling her what they think. Delilah herself has become more and more worried over time about her health and how much money she spends on cigarettes. She thinks she only smokes out of habit these days, she doesn't really enjoy it that much. She feels the time is right, she is ready and reckons this time she can do it.

Question

Based on what you know about the theory of planned behaviour, what do you think Delilah's chances of giving up are? Explain your answer.

Evaluation

Research support

One strength of the TPB is that there is research evidence to support it.

For example, in a study by Martin Hagger *et al.* (2011) 486 participants completed questionnaires about their alcohol-related behaviours (and completed them again one month and three months later). The researchers found that personal attitudes, subjective norms and perceived behavioural control all **correlated significantly** with the intention to limit drinking to the guideline number of units. Intentions were also found to predict the number of units actually consumed after one month and three months. Perceived behavioural control predicted actual unit consumption directly (and not just intention).

These findings support predictions derived from the theory which suggests it is valid.

Counterpoint However, the findings of this study were not all supportive of the TPB. The study failed to predict some alcohol-related behaviours. For example, attitudes, norms, control and intentions did not correlate significantly with the number of binge-drinking sessions after one month or three months. Based on these findings, it appears that the success of the TPB may depend on the type of addiction-related behaviour being measured.

This suggests that even supportive research indicates that the predictive validity of the TPB is limited.

Short-term effects

One limitation is that some research has found short-term effects only.

Rosie McEachan *et al.* (2011) conducted a **meta-analysis** of 237 tests of the TPB in predicting health behaviours (including addiction-related ones). They found that the strength of the correlation between intentions and behaviour varied according to the length of time between the two. Intention to stop drinking can predict actually giving up drinking, but only if the time between intention and behaviour is less than about five weeks. The evidence is much weaker when the time interval between intentions and behaviour is longer.

Therefore intentions may not predict changes to addiction-related behaviour in the longer term, limiting the usefulness of the TPB.

Intention–behaviour gap

Another limitation of the TPB is that it cannot account for the *intention–behaviour gap*.

The theory cannot adequately explain how actual behaviours are caused by intentions. Rohan Miller and Gwyneth Howell (2005) studied the gambling behaviour of underage teenagers. They found strong support for some parts of the TPB (participants' attitudes, norms and perceived control all were related to their *intentions* to stop). But the key element of the TPB was not supported – the intentions were not related to the actual gambling *behaviour*. Many psychologists now question whether the TPB is a theory of behaviour change at all.

Therefore if the theory cannot predict behaviour change, we cannot use it to help change behaviour.

Evaluation eXtra

Rational decision-making

The TPB claims that addiction is the result of rational decisions. For example, making a cost-benefit analysis by weighing the balance of favourable and unfavourable opinions.

However, decisions about taking drugs/gambling may not be rational. Many factors make decision-making irrational, e.g. emotions, cognitive biases and stress not explained by the TPB. TPB data comes from questionnaires, in which a person may express rational thoughts which are ultimately not reflected in behaviour.

Consider: *To what extent is the TPB correct that decision-making is rational in addiction?*



According to the theory of planned behaviour, our intention to change our behaviour depends partly on what we believe other people think about what we're doing (called 'subjective norms').

Apply it Methods — Best of intentions?

A researcher decided to investigate whether people's intention to give up smoking is related to who actually gives up. She recruited 100 participants and interviewed them to establish their intentions. She asked several questions and derived for each participant an *intention score* from 0 (no intention at all to give up smoking) to 15 (strong intention to give up). She then formed two groups from these scores, high intention and low intention. One month later she measured who had given up smoking.

Questions

1. Explain *one* way in which the researcher could use **standardisation** as a method of control in this study. (*2 marks*)
2. The researcher wanted to ensure a balance of genders in her sample of participants. Outline how she could have used **stratified sampling** to achieve this. (*2 marks*)
3. Explain *one* limitation of this sampling method. (*2 marks*)
4. Explain how the researcher could have established the **validity** of the *intention score*. (*2 marks*)
5. Explain how **investigator effects** might have influenced the outcome of this study. (*2 marks*)

Apply it Concepts — Can I cut down?

Greg doesn't think he is exactly addicted to alcohol, but he is worried about how much he drinks. He has tried in the past to cut down through 'willpower' but it never works. He just wishes he knew what might make a difference if he were to try again.

Question

You are Greg's friend and you're familiar with the theory of planned behaviour. What advice would you give Greg based on this theory?

Check it

1. Outline the theory of planned behaviour in relation to addictive behaviour. *[6 marks]*
2. Explain how the theory of planned behaviour could be used to change **one** addictive behaviour. *[4 marks]*
3. Describe **and** evaluate the theory of planned behaviour in relation to addictive behaviour. *[16 marks]*

Applying theories of behaviour change to addiction: Prochaska's model

The specification says...

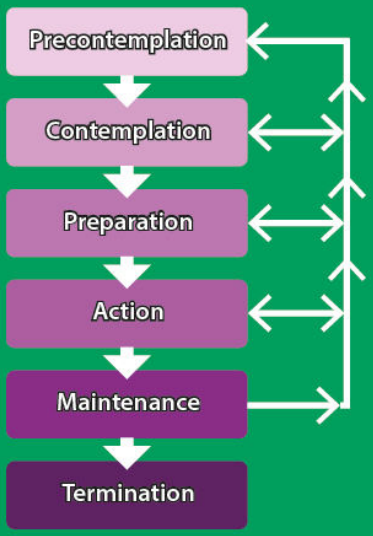
> The application of the following theories of behaviour change to addictive behaviour; Prochaska's six-stage model of behaviour change.

The six-stage model of behaviour change was originally formulated to explain recovery from nicotine addiction, but since then it has developed to the point where it is probably the most widely used model of addiction-related behaviour change.

Key term

Prochaska's six-stage model This explains the stages people go through to change their behaviour. It identifies six stages of change (and is sometimes referred to as the 'Stages of change' model), from not considering it at all to making permanent changes. The stages are not necessarily followed in a linear order.

Prochaska's six-stage model of behaviour change.



Study tip

Students often ask, 'Should I include a diagram in my essay?' Diagrams are great for helping your own understanding, which is why there are some in this book. But they're not so useful in essays as it is likely to simply repeat what you have written – better to focus on a clear and detailed explanation. So, on balance, avoid diagram danger. (However, you may just want to do a quick sketch to trigger your own memory.)

The six-stage model of behaviour change

Assumptions of the model

James Prochaska and Carlo DiClemente (1983) noticed that smokers' behaviour changed during the time that they were trying to quit. **Prochaska's six-stage model** recognises that overcoming **addiction** does not happen quickly or in a tidy linear order from start to finish. It is not a single event but a cyclical process: clients progress through stages but they also return to previous ones, and some stages may even be missed out altogether.

The model is based on two major insights. First, people who are addicted differ in how *ready* they are to change their behaviour. Some are thinking about it, some are already doing something about it and others have decided to do nothing. Second, the usefulness of treatment intervention depends on the stage the person is currently in. Some interventions will be most effective at an early stage of the recovery process but less useful later on.

Six stages of behaviour change

Precontemplation (*'Ignorance is bliss'*) People in this stage are not thinking about changing their addiction-related behaviour in the near future (usually defined as the next six months). This may be because of *denial* – the person has never considered changing because they don't believe they have a problem. Or it may be because of *demotivation* – the person may have tried unsuccessfully many times to abstain, so is now demoralised and doesn't currently intend to try again. Intervention at this stage should focus on helping the person to consider the need for change.

Contemplation (*'Sitting on the fence'*) Someone at this stage is thinking about making a change to their behaviour in the next six months. This does not mean they have decided to change. They are just increasingly aware of the need for change (e.g. their health) but they are also aware of the costs (e.g. less enjoyment). Because people can remain in a chronic state of contemplation for a long time, the most useful intervention would be to help the person finally see how the pros of overcoming addiction outweigh the cons.

Preparation (*'OK I'm ready for this'*) Now the individual believes that the benefits are greater than the costs, he or she decides to change their addiction-related behaviour some time within the next month. However, they haven't yet decided exactly how and when to change. So the most useful form of intervention is support in constructing a plan, or in presenting them with some options (e.g. seeing a drugs counsellor, calling a helpline or making a GP appointment).

Action (*'Let's do this'*) People at this stage have done something to change their behaviour in the last six months. For example, this is when the **cognitive** and **behaviour therapies** outlined on earlier spreads may be effective. Or the person will do something less formal but still meaningful, such as cut up their cigarettes or pour all the alcohol in the house down the sink. The action the person takes must substantially reduce their risk (e.g. giving up cigarettes altogether rather than just switching to low-tar versions). Effective intervention at this stage focuses on developing the coping skills the client will need to quit and maintain their change of behaviour into the next stage.

Maintenance (*'Stay on track'*) The person has maintained some change of behaviour (e.g. stopped gambling) for more than six months. The focus is on relapse prevention – avoiding situations where cues might trigger the addiction. The person becomes more confident that abstaining can be continued in the longer term because it is becoming a way of life. Intervention focuses on relapse prevention, and aims to help the client to apply the coping skills they have learned and use the sources of support available to them.

Termination At this stage, newly acquired behaviours such as abstinence become automatic. The person no longer returns to addictive behaviours to cope with anxiety, stress or loneliness. This stage may not be possible or realistic for some people to achieve. It may be that the most appropriate goal for many is to prolong maintenance for as long as they can, accepting that relapse is inevitable but providing the person with the skills to work through the earlier stages of the process quickly. No intervention is required.

Apply it Concepts

In denial, big time

Tomas has been drinking alcohol to excess for several months and his life is in a mess. His wife has left him, taking the children, and he has recently been sacked from his job for turning up drunk once too often. Although he feels sorry for himself from time to time, he still doesn't really believe he has a problem. He always insists he has his drinking under control and looks astonished and offended when friends suggest he gets help.

Questions

1. What stage of Prochaska's model is Tomas at?
2. Explain how the model suggests he can best be helped to progress to the next stage of the recovery process.
3. Briefly explain what the model predicts should happen to Tomas next if all goes well.

Evaluation

Dynamic process

One strength is that the model views recovery as a dynamic process.

Earlier theories have considered recovery from addiction as a single 'all-or-nothing' event (which is also the view commonly held by many people). In contrast, the six-stage model emphasises the importance of time, overcoming an addiction such as smoking is a continuing process. This is why the model proposes that behaviour change occurs through six stages of varying duration for each person. Although progress through the stages is always in the same order for everyone, there is also recycling backwards to different degrees and stages can be missed out.

This suggests that this stage model provides a realistic view of the complex and active nature of recovery from addiction.

Counterpoint However, the stages themselves have been criticised for being arbitrary. This means there is no research evidence to distinguish one stage from another. På Kraft *et al.* (1999) argue that the six stages can be reduced to just two useful ones: precontemplation, plus all the others grouped together. This has important implications because according to the model, each stage is matched with a particular type of intervention.

This suggests that Prochaska's stage model has little usefulness both for understanding changes over time and for treatment recommendations.

Positive view of relapse

Another strength is that the model views relapse realistically.

'Relapse is the rule rather than the exception' according to DiClemente *et al.* (2004). The six-stage model does not view relapse as failure, but as an inevitable part of the 'untidy', non-linear, dynamic process of behaviour change. Even so, relapse is more than just a slip, so the model also takes it seriously and does not underestimate its potential to blow change entirely off course. Recovering from addiction may require several attempts to get it right, to make it last, or to reach the maintenance or termination stages.

This means the model has **face validity** with clients and is more acceptable because they can see it is realistic about relapse.

Contradictory research

One limitation is that there is evidence challenging the model.

David Taylor *et al.* (2006) conducted a major review for the National Institute for Health and Care Excellence (NICE), analysing 24 reviews and **meta-analyses** of the six-stage model. They concluded that the model was no more effective than appropriate alternatives (e.g. the theory of planned behaviour, previous spread) in changing nicotine addiction-related behaviours. Perhaps even more critically, they also concluded that the key concept of defined stages in behaviour change could not be validated by available data.

This suggests the overall research picture is negative, despite optimistic claims made for the model by some.

Evaluation eXtra

Model of behaviour change?

Prochaska's model is a model of behaviour change. This is because it emphasises that change unfolds over time and depends on whether someone is ready to change. Also, the model assumes that an effective intervention will move a client on to the next stage by motivating them to change their behaviour.

On the other hand Prochaska's model is arguably not really a model of behaviour change. This is because clients move between stages (and can go backwards) regardless of whether their behaviour changes or not.

Consider: *Is Prochaska's model a model of behaviour change or not?*

Apply it Concepts — No going back?

Sigourney gave up smoking seven months ago, after taking an online CBT programme. She's quite proud of the fact that she hasn't touched a cigarette in all that time so far. But she isn't complacent and she knows the biggest risk for her now is relapsing back into her old habits.

Questions

1. What stage of Prochaska's model is Sigourney at?
2. What does the model predict could happen to her if she relapses?
3. How could she be helped?



Prochaska's model describes how someone addicted to alcohol might take this action – they might just learn to say no.

Apply it Methods — Ready or not?

A psychologist wanted to see if people who are most ready to give up smoking are more likely to do so. She recruited 20 smokers and gave them a *Readiness to change* (RtC) questionnaire which included such items as 'How likely are you to give up smoking in the next month?' All the participants then underwent a six-session CBT programme which focused on changing their patterns of thinking about smoking. The participants were all followed up after 12 months. The psychologist found a correlation coefficient of −.72 between readiness to change and the average number of cigarettes smoked per day.

Questions

1. Write a **non-directional hypothesis** for this study. (*2 marks*)
2. Identify *one* variable in this study other than those being measured. Explain how the variable might have affected the results. (*3 marks*)
3. Explain how the psychologist could have checked the **validity** of the RtC **questionnaire**. (*3 marks*)
4. Which **measure of central tendency** should the psychologist have used to calculate the average number of cigarettes smoked per day? Explain your answer. (*3 marks*)
5. Explain what is meant by the phrase 'a **correlation coefficient** of −.72 between readiness to change and the average number of cigarettes smoked per day'. (*2 marks*)

Check it

1. Identify **one** addictive behaviour and explain how Prochaska's six-stage model of behaviour change could be used to explain change in addictive behaviour. *[4 marks]*
2. Outline Prochaska's six-stage model of behaviour change as a theory of addictive behaviour. *[4 marks]*
3. Discuss Prochaska's six-stage model of behaviour change as a theory of addictive behaviour. *[16 marks]*

Practical corner

The specification says...

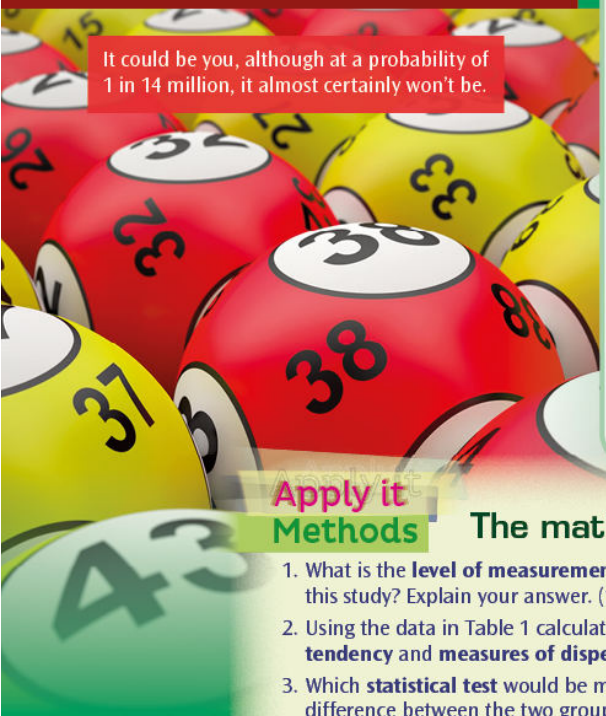
> Knowledge and understanding of ... research methods, practical research skills and maths skills. These should be developed through ... ethical practical research activities.

This means you should conduct practical activities wherever possible. On this spread, there is a quasi-experiment to test a prediction about distorted thinking based on the cognitive theory of gambling addiction. You will also find a suggestion for researching the reasons why people smoke using content analysis.

Ethics check

We strongly suggest that you complete this checklist before starting:

1. Do participants know participation is voluntary?
2. Do participants know what to expect?
3. Do participants know they can withdraw at any time?
4. Are individuals' results anonymous?
5. Have I minimised the risk of distress to participants?
6. Have I avoided asking sensitive questions?
7. Will I avoid bringing my school/teacher/psychology into disrepute?
8. Have I considered all other ethical issues?
9. Has my teacher approved this?



It could be you, although at a probability of 1 in 14 million, it almost certainly won't be.

Practical idea 1: Thinking about probability

The **cognitive** theory of gambling **addiction** emphasises the central role of cognitive biases in gambling. These are the many distorted ways of thinking about **probability** and chance that addicted gamblers apparently demonstrate. We might expect to find some differences in probability-related thinking between people who gamble regularly and people who do not gamble at all.

The practical bit

Ethical issues

Because gambling (even when it is not an addictive behaviour) is a sensitive subject for most people, it's as well to give **ethical issues** some extra thought right from the outset. You need to choose a form of gambling that most people would consider 'mild' and doesn't have any real stigma attached to it. It should also be something the majority of people wouldn't mind being asked about. An ideal choice is looking at people who do and do not play the National Lottery.

The questions that you ask must also be carefully written, not just because they could be viewed as an invasion of **privacy** but also because of potential **psychological harm.** Some participants will show evidence of distorted thinking about probability and chance. They could easily assume that this reflects on their intelligence and that their answers must mean they are 'stupid' (or at the very least 'irrational'). Your **debriefing** should provide them with reassurance on this point. Your questions should be phrased very carefully to avoid the impression that you are judging your participants' intelligence.

Assessing cognitive distortions

Bearing in mind these ethical matters, you will need to create your own scale to measure people's views of probability and chance. Produce ten multiple choice and/or 'yes–no' questions which all have objectively correct answers. This will allow you to derive a score out of ten for each participant – the higher the score, the more distorted their thinking about chance.

Your questions should cover a range of cognitive distortions. Here are some suggestions for you to consider. Which of the following set of numbers is more likely to be drawn in the Lottery – 11, 12, 13, 14, 15, 16 or 7, 22, 24, 28, 33, 43? If you toss a coin five times and it comes up heads each time, on the sixth toss is it more likely to come up heads or tails or are both equally likely? Is it better to select your own numbers in the Lottery than choose a 'lucky dip'?

Selecting your participants

You are going to compare people who play the National Lottery regularly (operationalise as 'every week') and people who never play it. So you need to recruit participants from both categories. The most straightforward way to do this is to use an **opportunity sampling** method. Approach people who may be available to take part, and simply find out from them whether they fit into either of these two groups, aim to find ten participants for each.

Analysing and presenting your data

Once you have added up the number of incorrect answers for each participant, you will have a 'distorted thinking' score for each one. You can then draw up a table like the one below. An appropriate **statistical test** will tell you whether the difference between the two groups is **significant**.

Apply it
Methods

The maths bit 1

1. What is the **level of measurement** of the **dependent variable** in this study? Explain your answer. (*1 mark + 1 mark*)
2. Using the data in Table 1 calculate suitable **measures of central tendency** and **measures of dispersion** for both groups. (*4 marks*)
3. Which **statistical test** would be most suitable to analyse the difference between the two groups? Give *two* reasons for your choice. (*1 mark + 2 marks*)
4. Apply this test to obtain a **calculated value**. State whether or not this value is significant and explain how you reached your conclusion. (*1 mark + 3 marks*)

Players	Non-players
6	1
3	8
8	3
4	4
7	7
4	2
5	6
6	5
7	5
9	4

Table 1 Number of incorrect answers given by 10 people who regularly play the National Lottery and 10 people who never play.

Practical idea 2: Risk factors for smoking

Research has shown that some people are more likely than others to become smokers. It may be because people differ in their degree of risk or it may be due to a variety of other factors.

This practical is neither an **experiment** nor a **correlational** study, but simply an exploration of the reasons people give for smoking. The aim is to use **content analysis** to find out how important the classic risk factors are in people's decision to start smoking.



It's unusual to see people smoke a pipe. Are the risk factors involved any different from those that lead to cigarette smoking? You could adapt this practical to find out.

The practical bit

Designing the study

You could do this by constructing a **questionnaire** that covers all the potential risk factors. Your participants would simply have to tick some boxes. This would be easy to score and allow you to identify and rank the risk factors in order of importance. But this method doesn't give your participants the opportunity to explain their reasons in the way they might like to. For example, the options you give them may not be the ones they would choose. By using an open-ended approach you can just allow your participants to speak for themselves. Unfortunately, this does mean more work for you, the researcher.

As a minimum, you should give your participants a description of what you would like them to do, which is basically to give as many relevant reasons as they can for why they smoke. You then provide them with the space to write their response. Incidentally, you may have realised by now that you could very easily conduct this whole procedure online, from recruiting participants to debriefing them, via email perhaps.

You could opt to add more structure to the procedure by giving an indication of which risk factors you would like your participants to consider (i.e. headings they can give their responses under). For instance, reasons relating to family, peer group, stress – all the factors explained at the beginning of this chapter. But try not to direct your participants too much. Remember that this is their chance to use their own words.

Sampling method

A **volunteer sample** would be appropriate for this practical, although this means you would have to advertise for smokers to come forward to participate. As a further development of the study, you could identify a demographic group that interests you – young people, older people, men, women, etc. Not to compare them but just to get an insight into the risk factors for smoking in a particular group. Aim to recruit between 10 and 20 participants.

Ethical considerations

One advantage of allowing participants to give their accounts in their own words without directing them too much is that they can decide how much information they are prepared to divulge. They are less likely to feel you are invading their privacy. But there is no room for complacency. The ethical dimension involved in asking about smoking behaviour and private matters such as stress and family influences needs to be at the forefront of your mind in designing and carrying out this practical.

Note that all participants should be over 16 (legal age for smoking).

Analysing your data

Using content analysis presents us with the challenge of trying to extract **quantitative data** from the information provided by the participants. Read about **content analysis** on page 64 in order to first of all create your categories.

You could start by drawing up a table of the major psychosocial risk factors for smoking: family influences (biological or social), peer group pressure, stress, personality. Read through your participants' accounts and identify all the reasons they give that match these broad categories. Keep a tally as you go. As you read, consider whether the categories need refining. Do you have enough information to be able to make finer distinctions? For example, can you distinguish between different kinds of family influences, or different types of stress? Is there a case for adding more headings? Be careful though, because you do not want to make the analysis too complex.

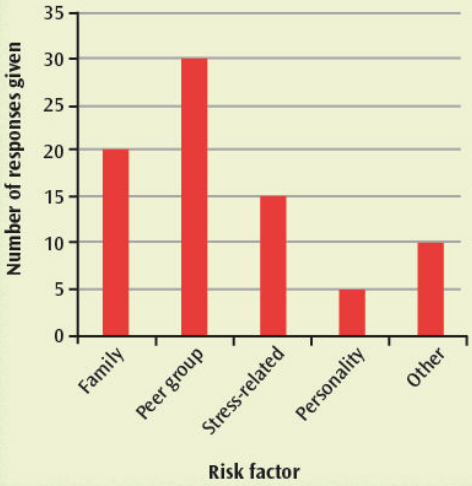
You could then calculate the numbers of responses in each category as percentages of the overall responses. You could also put the risk factors in rank order of frequency and draw a suitable graph to represent the data.

Apply it Methods

The maths bit 2

1. Identify the type of graphical display shown in the graph below. (*1 mark*).
2. Use the data in the graph to draw an appropriate table of results. (*3 marks*)
3. The total number of responses identified in this research was 80. Calculate the figures in each category as a percentage of the total responses. (*4 marks*)
4. Outline *one* conclusion you can draw based on all the information you have available. (*3 marks*)

Graph showing reasons given for smoking classified by risk factor.



The maths bit

Overall, at least 10% of the marks in assessments for Psychology will require the use of mathematical skills and this is included in the requirement that at least 25–30% in total will involve research methods.

Don't avoid it!

Revision summaries

Describing addiction

Understanding what addiction is.

The description

Physical and psychological dependence
Physical – withdrawal occurs when abstaining.
Psychological – compulsion to experience effects.

Tolerance
Repeated exposure means a greater dose is needed to experience the same effects. Note: behavioural and cross-tolerance.

Withdrawal syndrome
Symptoms occur when physically dependent person abstains or reduces their use. Acute and prolonged withdrawal phases.

Risk factors in the development of addiction

Anything that increases the likelihood of addiction.

Risk factors

Genetic vulnerability
Some people inherit a vulnerability to addiction:
1. D2 receptors low, so need more dopamine.
2. Nicotine enzyme (CYP2A6) low in those who smoke less.

Stress
ACEs (early trauma) damage developing brain, creating vulnerability to later stressful life events, drugs used to self-medicate (Andersen and Teicher).

Personality
No addictive personality, but APD is a risk factor for addiction – involves norm-breaking, impulsivity, criminal behaviours and being self-centred, so drawn to drug-taking (Robins).

Family influences
Increased risk in adolescence from exposure (e.g. family drinking, Livingston *et al.*) and adolescent's perceived lack of parental monitoring.

Peers
(1) norms about drinking, (2) opportunities to drink, (3) people overestimate how much peers drink (O'Connell *et al.*).

Evaluation

Interactions between factors
It's the combinations that affect nature and severity of addictions (Mayes and Suchman), also risk factors can be protective.

Central role of genes
Most risk factors are proximate causes, but link ultimately to genes.

Genetic vulnerability
Adopted child at greater risk if one biological parent was an addict (Kendler *et al.*).

Stress
Correlated with addiction but stress may be caused by person's lifestyle rather than being the risk factor.

Personality
APD and alcohol dependence are co-morbid but APD develops first, so it is a cause (Bahlmann *et al.*).

Family influences
Correlation found between parents' and children's use of cannabis (Madras *et al.*).

Peers
Social norms marketing advertising can correct estimates about how much peers drink (e.g. beer mats, posters).

Explanations for nicotine addiction

Brain neurochemistry

A biological explanation.

The role of dopamine

nAChRs and dopamine
nAChRs activated by ACh or nicotine, transmit dopamine then shut down (desensitised, downregulated).

Creating a pleasurable effect
Dopamine released from VTA, transmitted via mesolimbic (via NA) and mesocortical pathways to frontal cortex.

Withdrawal
Period without nicotine means nAChRs resensitised/upregulated and then overstimulated by ACh.

Dependence and tolerance
Avoiding withdrawal creates a cycle of up + downregulation, long-term desensitisation of nAChRs leads to tolerance.

Evaluation

Research support
People with schizophrenia taking dopamine antagonist Haloperidol increased smoking → dopamine (McEvoy *et al.*).
Counterpoint – other neurochemical systems are involved, e.g. GABA and endorphins (Watkins *et al.*).

Real-world application
NRT delivers controlled nicotine to bind with nAChRs and increase dopamine release, reduces withdrawal symptoms slowly.

Withdrawal symptoms
Not correlated with blood nicotine levels, may be personality e.g. neurotics have worse withdrawal symptoms (Gilbert).

Evaluation extra: Determinism
Neurochemistry suggests addiction inevitable, but many smokers don't become dependent (Shiffman and Paty), also personality.

Learning theory

A psychological explanation.

The theory

Operant conditioning
Positive reinforcement – nicotine has pleasurable effects on brain's dopamine reward system.
Negative reinforcement – continue to smoke to avoid the unpleasant withdrawal effects.

The role of cue reactivity
Smoking/nicotine rewarding (primary reinforcer), associated positive cues are secondary reinforcers (e.g. lighter).
Cue reactivity (1) Desire, (2) autonomic response, (3) behavioural indicator.

Evaluation

Research support
Rats increasingly licked water spout that delivered nicotine (Levin *et al.*).

Support for cue reactivity
Dependent smokers increased arousal/cravings when shown smoking cues (Carter and Tiffany).

Real-world application
Aversion therapy with electric shocks counterconditions nicotine addiction, 52% abstinence (Smith).
Counterpoint – no control/placebo group, invalid comparison, aversion therapy benefits short-lived (Hajek and Stead).

Evaluation extra: Animal research
Animals used as conditioning mechanisms similar and for ethical reasons, but human addiction more complex and ethical reasons not to use animals.

Explanations for gambling addiction

Learning theory

Explaining addiction using conditioning.

The theory

Vicarious reinforcement
Observing others rewarded for gambling (e.g. friends).

Direct positive and negative reinforcement
'Buzz' of gambling (positive), escape from anxiety (negative).

Partial reinforcement
Gambling persists even when not rewarded because unpredictable which bets pay off.

Variable reinforcement
Unpredictable pattern (e.g. average of 8 spins), resistant to extinction.

Cue reactivity
Cues associated with gambling (secondary reinforcers) can trigger arousal and craving.

Evaluation

Research support
High-frequency gamblers placed bets in last two minutes before race, prolonged rewarding excitement (Dickerson).
Counterpoint – only one observer, can't check reliability of observations.

Limited explanation
Cannot explain gambling addiction in which the reward comes long time after the bet.

Explains failure to stop
Conscious desire to stop conflicts with automatic conditioning processes that drive gambling.

Evaluation extra: Cycle of addiction
Learning theory explains whole cycle, but can't explain those who don't become addicted.

Cognitive theory

Explaining addiction using cognitive biases.

The theory

Expectations
Role in initiating gambling, overestimate benefits and underestimate costs of gambling.

Cognitive biases
Skill/judgement (illusion of control), personal/rituals (superstitions), selective recall (forget losses), faulty perceptions (gambler's fallacy) (Rickwood *et al.*).

Self-efficacy
Expectations about inability to give up are self-fulfilling.

Research into cognitive biases
'Thinking aloud' method, content analysis. Gamblers make 6 times more irrational statements than controls (Griffiths).

Evaluation

Research support
Addicted gamblers had more gambling-related cognitive biases than non-gamblers (Michalczuk *et al.*).
Counterpoint – high scores on cognitive biases questionnaire may be to justify gambling.

Further research support
Stroop task, gamblers' cognitive bias to attend to gambling-related information (McCusker and Gettings).

Methodological problem
'Thinking aloud' method does not reflect true beliefs (Dickerson and O'Connor).

Evaluation extra: The true explanation?
Cognitive explanation shows how gambling behaviour turns into addiction, but biases are proximate (may ultimately be biological).

Reducing addiction

Drug therapy

Drugs are the obvious solution to neurochemical causes.

The therapy

Three types of drug therapy
Aversives produce unpleasant consequences (e.g. *disulfiram*, severe hangover), classical conditioning.
Agonists activate same receptors (e.g. *methadone*).
Antagonists block receptors (e.g. *naltrexone*).

Drug therapy for nicotine addiction
NRT (agonist) activates nAChRs, produces dopamine, avoids withdrawal. Dose reduced to manage withdrawal.

Drug therapy for gambling addiction
No official drugs but *naltrexone* (opioid antagonist) enhances GABA, reducing dopamine in NA (and frontal cortex), reducing gambling (Kim *et al.*).

Evaluation

Research support
All forms of NRT better to quit smoking than placebo/no therapy, 60% increase (Hartmann-Boyce *et al.*).
Counterpoint – meta-analysis only included published studies, mainly positive results (publication bias).

Side effects
NRT e.g. sleep problems, headaches. Gambling (high levels of *naltrexone*) e.g. spasms, anxiety – clients may discontinue.

Reduces stigma
Drug therapy shows addiction has a neurochemical basis, so may avoid self-blame and assist recovery.

Evaluation extra: Costs and benefits
Serious costs to drug therapy (e.g. side effects) and not a cure, but benefits, e.g. cost-effective and non-disruptive.

Behavioural interventions

Therapies based on learning theories.

Aversion therapy

Addiction learned through classical conditioning, unlearned through counterconditioning.

Aversion therapy for alcohol addiction
Disulfiram + alcohol causes nausea, through association become CSs producing CR (expectation of nausea).

Aversion therapy for gambling addiction
Electric shock (UCS) is given when person reads out gambling-related phrase (NS then CS), causes pain (UCR then CR).

Evaluation

Methodological problems
25 studies reviewed, no blinding so inbuilt biases affected judgements (Hajek and Stead).

Poor long-term effectiveness
Disulfiram group + control group (both also received counselling), no difference in outcome, counselling may have had bigger impact (Fuller *et al.*).

Evaluation extra: Ethical issues
Aversion uses punishment, and not effective (so unethical), but preferable to addiction (small shocks are not life-threatening).

Covert sensitisation

Also classical conditioning. Unpleasant stimulus imagined (*in vitro*), not real (*in vivo*).

Covert sensitisation in practice
Imagine cigarettes covered in faeces or slot machine with snakes, imagine relief at not smoking/gambling.

Evaluation

Research support
Covert sensitisation led to reduced gambling (90%) after one year than aversion therapy (30%) (McConaghy *et al.*).

Methodological criticism
Research often compares two behavioural therapies, but addiction includes non-learning causes (CBT better).

Evaluation extra: Symptom substitution
Covert sensitisation only suppresses addiction (issues remain and symptom substitution), but does change behaviour and can also treat new symptoms.

Cognitive behaviour therapy

Therapy based on thinking differently and developing skills.

The therapy

Cognitive behaviour therapy (CBT)
Aims to change cognitive biases underlying addiction and develop behaviours/skills to cope.

1. Cognitive – Functional analysis
Client and therapist identify high-risk situations, reflect on thinking before, during, after.
Cognitive restructuring – therapist challenges client's thoughts, ongoing process through CBT.

2. Behavioural – Skills training
Client learns skills to replace addiction with constructive ways of coping.
Specific skills – to cope with triggers e.g. anger management.
Social skills – to cope in social situations e.g. refusing alcohol firmly making eye contact. Therapist models behaviour, client role plays.

Evaluation

Short term only
CBT reduced gambling for up to three months, but no better than controls after 9–12 months (Cowlishaw *et al.*).
Counterpoint – a better controlled study (e.g. random allocation) found gamblers using CBT gambled less after 12 months than controls (Petry *et al.*).

High drop out
Five times greater for CBT than other therapies, clients often leave as soon as a crisis is resolved (Cuijpers *et al.*).

Relapse prevention
Relapse seen as inevitable but manageable, an opportunity for more cognitive restructuring.

Evaluation extra: Do we need the C in CBT?
Changing cognitions is central to CBT plus avoids symptom subsitution. But CBT could focus just on behaviour because cognition-focus is demanding.

Applying theories of behaviour change to addiction

Theory of planned behaviour

Explains how we change behaviour we can control.

The theory

Central concept is intention (Ajzen).
Change behaviour deliberately through rational decisions. Addiction-related behaviour can be predicted from our intentions.

1. Personal attitudes
Overall evaluation of favourable and unfavourable attitudes the person has towards their addiction.

2. Subjective norms
A person's beliefs about whether friends/family approve or disapprove of addiction.
Application – give information about true extent of addiction in peers (e.g *Talk to Frank*).

3. Perceived behavioural control
Self-efficacy, addict's belief they can stop. Affects behaviour indirectly (intentions) and directly.
Application – encourage confidence in ability to change, emphasise effort required.

Evaluation

Research support
Attitudes, norms and control all correlated with intentions, predicting actual alcohol consumption (Hagger *et al.*).
Counterpoint – some alcohol-related behaviours were not predicted (binge drinking).

Short-term effects
Meta-analysis, intentions predict health-related behavioural changes only up to five weeks (McEachan *et al.*).

Intention-behaviour gap
Attitudes, norms and control were related to intentions to stop in teenage gamblers, but not to behaviour (Miller and Howell).

Evaluation extra: Rational decision-making
TPB claims addiction results from rational decisions, but decisions irrational (due to e.g. stress) and TPB based on rational questionnaire responses.

Prochaska's model

Six-stage model related to readiness to change.

The model

Assumptions of the model
Overcoming addiction occurs in stages in a cyclical not linear fashion, each stage matched with an intervention.

Six stages of behaviour change
Precontemplation – not thinking about change. Intervention = help client consider need.
Contemplation – thinking of change next 6 months. Intervention = pros vs. cons.
Preparation – change in next month. Intervention = make a plan.
Action – something done in last 6 months. Intervention = supply coping skills.
Maintenance – change continued for 6 months. Intervention = prevent relapse.
Termination – new behaviours now automatic, not realistic for everyone.

Evaluation

Dynamic process
Model moves away from 'all-or-nothing' approach, and emphasises continuing process with some backwards recycling.
Counterpoint – stages are arbitrary, can be reduced to precontemplation plus one other (Kraft *et al.*).

Positive view of relapse
Relapse is part of behaviour change and not failure, recovery may take several attempts (DiClemente *et al.*).

Contradictory research
NICE review showed model no more effective than alternatives in nicotine addiction, concept of stages not validated (Taylor *et al.*).

Evaluation extra: Model of behaviour change?
Interventions are aimed at behaviour changes), but clients actually move between stages regardless of behaviour change.

Practice questions, answers and feedback

Question 1 Explain aversion therapy as a behavioural intervention for reducing addiction. (*4 marks*)	
Morticia's answer *Aversion therapy is used to treat addiction following the principles of classical conditioning. What happens in classical conditioning is that an unconditioned stimulus is paired with an unconditioned response. A neutral stimulus then occurs alongside the unconditioned stimulus and takes on those properties so that it produces the unconditioned response, now called a conditioned response because it is a new stimulus-response link. In aversion therapy a painful stimulus is paired with the addiction so they learn a new stimulus-response to stop them doing the addictive behaviour.*	Morticia clearly has a good command of the underlying theory here – the principles of classical conditioning are very well explained. However, the link to addiction is only partial. A clear example linked to a specific addiction would have been useful.
Luke's answer *Alcohol addiction is sometimes treated by giving the individual a drug that makes them feel very sick and vomit whenever they drink. They learn a new association (counterconditioning) between the taste/smell of alcohol and this very unpleasant reaction. This replaces the old link between alcohol and pleasure. The person quickly fears experiencing the vomiting so they usually decide not to drink.*	Immediately, Luke provides us with the example that Morticia's answer lacked. There is less theoretical information about the behaviourist approach in general here but much more focus on the question.
Vladimir's answer *Aversion therapy aims to make the individual avoid their addiction by pairing it with something unpleasant (aversive). So, in the case of gambling, a person might be given electric shocks every time they say a word associated with gambling. Therefore the thoughts of gambling become associated with something unpleasant and when the person thinks of gambling they want to stop.*	The basic principle of pairing an aversive stimulus with an addictive behaviour is made clear in Vladimir's answer.
Aversion therapies sometimes use drugs to make someone feel nauseous and this is associated with, for example, alcohol or something else that is addictive such as drugs.	The second paragraph provides an example that is more typical.
There are ethical issues with such aversion therapies because you are causing a person to have a very unpleasant experience and it may not be their choice. Also the unpleasantness may mean they don't really want to continue with the therapy.	The final paragraph is more evaluative than descriptive and is not required by the question. Writing too much is not a good approach to top-class answers as you are wasting important time.

Question 2 Evaluate **one** explanation for gambling addiction. (*4 marks*)	
Morticia's answer *Gambling addiction has been explained in terms of cognitive theory. According to this theory, the reason people gamble is because they have biased beliefs, which make them think they will win, and so they keep going. One strength of this approach is that there is research support that shows gamblers have different thought processes so it makes sense that this may be an underlying cause. For example, a study using the Stroop task showed that gamblers were slower with words related to addiction (McCusker and Gettings). So it then makes sense to use a cognitive-directed therapy to treat such addictions.*	The initial descriptive detail in Morticia's answer is not asked for in the question and could have been dispensed with. The rest of the answer is relevant, however, and elaborated in good detail which means that one criticism is sufficient.
Luke's answer *One problem with explanations of gambling is that it isn't one single type of behaviour so no one explanation can explain all gambling. For example, in some types of gambling the reward comes quite a long time after the initial behaviour whereas for conditioning to take place the two things have to happen at almost the same time as in fruit machine wins.*	Luke's is an odd answer that seems more concerned with questioning the premise of the question! If we interpret the answer as an evaluation of the learning theory explanation of gambling – even though this is not made explicit – then the points he makes are relevant but overall the response lacks clarity.
And there are also different aspects of the addiction from when it begins to maintenance and relapse. So initiation might be explained in terms of social learning (vicarious reinforcement), maintenance may be due to continuing rewards (operant conditioning) and relapse may be because some things remind you of your gambling (cue reactivity).	
Vladimir's answer *One explanation for nicotine addiction is brain neurochemistry. This is a good explanation because there is good supporting evidence. For example, McEvoy looked at patients with schizophrenia who were taking a drug that blocks dopamine receptors in the brain, and found that this was associated with increased smoking. This suggests that the patients were smoking to compensate for the lack of dopamine. And therefore this supports the view that nicotine addiction is related to getting a dopamine reward.*	Vladimir's first paragraph is focused on the wrong type of addiction.
On the negative side the research on neurochemistry shows that a dopamine explanation is too simple because lots of neurotransmitters are involved as well as dopamine, such as GABA and serotonin. Though it may be that the dopamine reward system is the most important.	However, the second paragraph (taken on its own) does briefly present some relevant research linking the dopamine reward system to gambling (a bit of cleaver application). However this is very brief.

On this spread we look at some typical student answers to questions. The comments provided indicate what is good and bad in each answer. Learning how to produce effective question answers is a SKILL. Read pages 387–397 for guidance.

Question 3 **Steph is taking her A level exams in a few weeks and is worried as she cannot seem to get around to revising. She has started to spend more and more time with her friends drinking alcohol at the local park. Steph likes her friends as they are generally seen as 'cool' by the other girls at school. Steph's friends like her because she is 'crazy' and does things on the spur of the moment. They also think it's funny that Steph has gone home drunk a couple of times and her parents (who also drink heavily) have not really said anything about it.**

Using your knowledge of addiction, describe and evaluate two or more risk factors that could contribute to Steph's drinking. (*16 marks*)

Morticia's answer *Reading about Steph you can see that a number of risk factors are described in the scenario. First, there is stress as her exams are coming up. People who are stressed turn to alcohol and drugs for relief. Second, there is the influence of her peers. At her age, peers are one of the strongest influences on behaviour. Peers are important for establishing norms about what behaviour and attitudes are acceptable. Peers also provide opportunities for, e.g. alcohol abuse. Moreover, a particular influence is that young people often overestimate what their peers are doing and therefore they may drink even more to keep up with what they think everyone else is doing. A further risk factor described here is the family. Families also create norms about what is acceptable behaviour. And lack of parental disapproval is also significant as well as the fact that having parents who drink means you are exposed to it. It may also be that the fact that parents who drink heavily may do so because it is in their genes and then Steph may have inherited these same genes. The genes would be related to dopamine probably, the reward pathway. Of course we must remember about the diathesis-stress model which is that just inheriting genes doesn't mean that you have to become addicted to alcohol or drink a lot. What the genes do is create a vulnerability and all these other factors discussed could act as triggers for a person with vulnerability. Another risk factor is personality. Certain kinds of personality are more likely to develop addiction and this is an example of an indirect genetic effect. For example, genes may predispose someone to have an antisocial personality disorder, which is associated with impulsivity. Having this kind of personality may make someone like Steph more at risk for alcohol problems.* *Many explanations are very determinist because they suggest that people can't control their own behaviour. For example, having peers that drink means a person has to drink as well. People have free will. These explanations may also be culturally-biased and not apply to non-Western cultures or collectivist ones where the community matters more. The research may lack ecological validity because it is not done with people who actually have addictions. The research is also often correlational so we can't say that such research shows a cause and effect, for example it might not be the peers who are creating the problem but Steph has selected those friends because she drinks.* **(416 words)**	A very long first paragraph here that manages to link all the information in the stem to relevant risk factors. (Such long paragraphs are hard to read – so it is preferable to break into smaller paragraphs to help someone reading this see the separate points being made.) There is also reference to the diathesis-stress model in there, an important criticism of genetic explanations, and there is a hint of evaluation in the way this is used to draw attention to the other factors as possible 'stressors'. The emphasis is clearly on the side of 'breadth' rather than 'depth' of response but this is a legitimate way to answer the question. That said, Morticia seems not to have left sufficient space for evaluation. Some of the points, such as that related to culture, are just opportunist, for example culture bias can always be mentioned but is it really relevant here? Others (the first and last) include some context and explanation. There would have been more value in writing one or two well-elaborated points instead of this string of partly relevant and 'easy' criticisms. It looks like Morticia just doesn't know specific criticisms and probably uses the same kinds of criticisms in all essays. This lack of evaluation means that, overall, this is a poor response.
Luke's answer *There are a number of important risk factors for addiction. I will focus on alcohol addiction as that is Steph's problem.* *Let's begin with genetic explanations – as she comes from a family of heavy drinkers her drinking may be due to inherited genes. One explanation is that people inherit an inability to metabolise certain substances and this is linked to addiction. However, an important criticism of any genetic explanation is that genes do not inevitably cause addiction they simply create a vulnerability. In fact if a person is never exposed to say alcohol they can't get addicted to it so social factors are important.* *Such social factors include family influences. In Steph's case, the fact that her parents do not appear to care about her drinking will increase her risk because she is not being 'punished' for her involvement with alcohol. In fact what may be most significant is the fact that Steph perceives that her parents don't monitor her and this encourages her.* *An even stronger influence than parents is peers and we can see that Steph's peers sound like they may have introduced her to drinking. O'Connell suggests that peers may influence an adolescent in three ways: attitudes and norms, opportunities and misperception of how much everyone else is drinking which leads to excessive use to keep up. In addition peer influences may be more generally about rule-breaking rather than being specific to addiction.* *A further risk factor described in relation to Steph is the stress of her exams. This could be an important trigger at this time. One issue with stress research and other research is that it is often correlational. For example, many studies have shown there is a strong correlation between stressful experiences and addiction-related behaviours. However, Steph's drinking could equally cause her more stress through feeling guilty or having more trouble with relationships. It is difficult to separate out the effects of one upon the other.* *Steph's personality is also mentioned – that she might be a little bit crazy and this may be a further risk factor. Research does not support the idea of an addictive personality but there are personality characteristics that are linked to addiction. Because she doesn't care about anyone else, perhaps Steph is developing antisocial personality disorder. This has been strongly linked to addiction because it involves norm-breaking and criminality. Such understanding is important for real-life applications because if we want to help Steph, we need to look at the risk factors that can be changed, such as peer norms that encourage drinking. If she is born with certain vulnerabilities such interventions might be useful.* **(435 words)**	The first sentence is not especially useful. Paragraph 2 illustrates how all three skills can be demonstrated together: description, evaluation and brief application to the stem. In paragraph 3 there is more detailed application and another relevant explanation. A further applied explanation is introduced in paragraph 4 and there is evaluative comment and use of evidence. This is followed by two further excellent paragraphs that follow a similar pattern to those previously: relevant explanation is identified, described, linked to stem and evaluated. A very competent response and not much longer than the first one. This is altogether a strong essay that provides all three required elements in the right amounts.

Multiple-choice questions

Describing addiction

1. **Psychological dependence:**
   (a) Rarely leads to habitual use of addictive substances.
   (b) Increases the body's level of arousal.
   (c) Is a compulsion to experience the effects of a substance.
   (d) Forms even when taking a substance is not followed by a reward.

2. **In relation to addiction, tolerance refers to:**
   (a) Taking a substance in order to avoid unpleasant withdrawal effects.
   (b) Taking more of a substance to get the usual effects.
   (c) Symptoms that appear when an addicted person stops taking a substance.
   (d) Continuing to take a substance until it becomes a habit.

3. **Withdrawal indicates that:**
   (a) A physical dependence has formed.
   (b) A psychological dependence has formed.
   (c) No dependence was formed.
   (d) There is no tolerance.

4. **The withdrawal phase that starts immediately is called the:**
   (a) Chronic withdrawal phase.
   (b) Prolonged withdrawal phase.
   (c) Acute withdrawal phase.
   (d) Immediate withdrawal phase.

Risk factors in the development of addiction

1. **In terms of personality, the most consistent risk factor for addiction is:**
   (a) Hostility.
   (b) Extraversion.
   (c) Antisocial personality disorder.
   (d) Neuroticism.

2. **One way in which genetic vulnerability can be a risk factor is:**
   (a) Friends providing access to drugs.
   (b) Social factors determining whether someone takes an addictive substance.
   (c) Low numbers of D2 receptors in the brain.
   (d) Stressful life events.

3. **Peers influence an adolescent's risk of addiction mainly because:**
   (a) They use threats of violence to enforce antisocial behaviour.
   (b) They create social norms about acceptable behaviour.
   (c) They are often genetically related.
   (d) Relationships with friends are a major source of stress.

4. **In Bahlmann *et al.*'s study the average delay between developing APD and alcohol addiction was:**
   (a) 1 year.
   (b) 2 years.
   (c) 3 years.
   (d) 4 years.

Explanations for nicotine addiction: Brain neurochemistry

1. **The desensitisation hypothesis states that:**
   (a) Nicotine has little effect on the dopamine reward system.
   (b) nAChRs shut down temporarily after stimulation.
   (c) nAChRs are stimulated by dopamine and serotonin.
   (d) nAChRs are continually being activated.

2. **The mesocortical pathway transmits dopamine directly to the:**
   (a) Frontal cortex.
   (b) Nucleus accumbens.
   (c) Ventral tegmental area.
   (d) Mesolimbic pathway.

3. **Many people with schizophrenia smoke heavily because:**
   (a) It is a symptom of their illness.
   (b) Nicotine overcomes the dopamine-blocking effects of their medication.
   (c) They always have done.
   (d) It reduces the side effects of their medication.

4. **Explaining nicotine addiction in terms of dopamine is inadequate because:**
   (a) Therapy targeting the dopamine reward system does not work.
   (b) Many people with schizophrenia smoke as self-medication.
   (c) Research shows dopamine is not that important.
   (d) Other neurotransmitters are involved in nicotine addiction.

Explanations for nicotine addiction: Learning theory

1. **Smoking to prevent an unpleasant withdrawal syndrome indicates:**
   (a) Secondary reinforcement.
   (b) Positive reinforcement.
   (c) Classical conditioning.
   (d) Negative reinforcement.

2. **Cue reactivity occurs through a process of:**
   (a) Operant conditioning.
   (b) Negative reinforcement.
   (c) Classical conditioning.
   (d) Reward and punishment.

3. **When a smoker is presented with images of smoking-related cues:**
   (a) They experience an unpleasant aversive reaction.
   (b) Physiological arousal increases and they crave a cigarette.
   (c) They tend to ignore them.
   (d) They take fewer 'drags' on a cigarette.

4. **Counterconditioning works by:**
   (a) Pairing smoking with a pleasurable stimulus.
   (b) Associating smoking with relief from unpleasant cravings.
   (c) Associating the effects of nicotine with an electric shock.
   (d) Associating smoking-related cues with the effects of nicotine.

Explanations for gambling addiction: Learning theory

1. **In a variable reinforcement schedule:**
   (a) Reinforcement arrives after an unpredictable number of responses.
   (b) Reinforcement arrives after a fixed proportion of responses.
   (c) Learning takes place quickly but is persistent.
   (d) Learning is extinguished relatively easily.

2. **Cue reactivity is a good explanation of how:**
   (a) A gambling addiction starts.
   (b) Addicted gamblers decide to stop gambling.
   (c) Addicted gamblers relapse after giving it up.
   (d) Males and females differ in their gambling behaviour.

3. **Type of reinforcement which is most resistant to extinction:**
   (a) Variable.
   (b) Partial.
   (c) Vicarious.
   (d) Cue reactivity.

4. **In Dickerson's study one limitation was:**
   (a) Order effects.
   (b) Problems with matching.
   (c) Demand characteristics.
   (d) Observer bias.

Explanations for gambling addiction: Cognitive theory

1. **The 'gambler's fallacy' refers to:**
   (a) Believing you are skilled at games of chance.
   (b) Thinking that some numbers are 'lucky'.
   (c) Remembering wins but ignoring losses.
   (d) Believing that the next gamble will bring a losing streak to an end.

2. **Self-efficacy is best described as:**
   (a) Belief in your willpower to overcome gambling.
   (b) A tendency to biased thinking.
   (c) Expectations about your ability to achieve a desired outcome.
   (d) Belief in your gambling skill.

3. **Research suggests that addicted gamblers differ from occasional gamblers because they:**
   (a) Are less impulsive.
   (b) Plan gambles carefully and logically.
   (c) Prefer smaller immediate rewards.
   (d) Can stop placing bets at any time.

4. **In Griffiths' study, gamblers made almost ____ times more irrational utterances than controls.**
   (a) 3.
   (b) 6.
   (c) 9.
   (d) 12.

Reducing addiction: Drug therapy

1. **Antagonists treat addiction by:**
   (a) Mimicking the effects of the substance of dependence.
   (b) Pairing the effects of drugs with nausea and vomiting.
   (c) Blocking receptors and inhibiting the usual effects.
   (d) Creating extreme sensitivity to an addictive substance.
2. **A significant strength of nicotine replacement therapy is:**
   (a) The nicotine operates in the brain in a different way from when the addict smokes.
   (b) It can be used for several years with no negative effects.
   (c) The nicotine dose can be reduced over time.
   (d) Different types of drug therapy are all equally effective.
3. **Side effects of drug therapy are a problem because:**
   (a) The individual might give up the therapy to avoid them.
   (b) They are usually completely unpredictable.
   (c) They affect everyone who goes through drug therapy.
   (d) They cause many deaths.
4. **A strength of drug therapy is it encourages the view that:**
   (a) Addicted people have psychological failings.
   (b) Addiction is a neurochemical matter.
   (c) Addicted people are morally weak.
   (d) Addiction should be stigmatised.

Reducing addiction: Behavioural interventions

1. **Aversion therapy and covert sensitisation are both based on:**
   (a) Operant conditioning.
   (b) Vicarious reinforcement.
   (c) Classical conditioning.
   (d) Observational learning.
2. **In covert sensitisation, the addicted client may:**
   (a) Be given electric shocks.
   (b) Change their way of thinking about their addiction.
   (c) Observe someone modelling non-addictive behaviours.
   (d) Imagine vomiting after taking their substance of dependence.
3. **Many studies of aversion therapy are not blinded, which means:**
   (a) The studies' procedures are carefully controlled.
   (b) Therapies are more effective than they appear.
   (c) The researchers know who is in treatment and placebo groups.
   (d) Valid comparisons can be made between different therapies.
4. **Hajek and Stead described methodological problems in studies as:**
   (a) Laughable.
   (b) Glaring.
   (c) Non-existent.
   (d) Encouraging.

Reducing addiction: Cognitive behaviour therapy

1. **Functional analysis in CBT involves the client:**
   (a) Identifying high-risk situations.
   (b) Practising anger management techniques.
   (c) Observing the therapist modelling a new skill.
   (d) Telling the therapist what needs to change.
2. **Skills training in CBT mostly involves:**
   (a) The therapist working out what triggers the client's cravings.
   (b) The therapist challenging the client's distorted thinking.
   (c) The client learning techniques to cope with high-risk situations.
   (d) The client and therapist identifying which skills the client lacks.
3. **Cowlishaw *et al.* conducted a meta-analysis of how many studies:**
   (a) 5.
   (b) 11.
   (c) 17.
   (d) 20.
4. **Drop-out rates for CBT are high because:**
   (a) The therapy is brief.
   (b) The crisis that forced the client into therapy often recedes.
   (c) Nearly all clients take homework tasks seriously.
   (d) The therapy is not as challenging as clients expect.

Applying theories of behaviour change to addiction: Theory of planned behaviour

1. **The basic assumption of the theory of planned behaviour is:**
   (a) Addiction can be overcome by controlling automatic behaviour.
   (b) Intention is the strongest predictor of ending an addiction.
   (c) To beat addiction, you have to ignore what other people think.
   (d) It doesn't matter what the addict personally thinks about drugs.
2. **Addictive behaviour can be directly influenced by:**
   (a) Perceived behavioural control.
   (b) Subjective norms.
   (c) Personal attitudes.
   (d) Automatic thoughts.
3. **'Subjective norms' in the TPB refers to:**
   (a) The addicted person's beliefs about what people closest to them think about their addiction.
   (b) How difficult the addicted person believes it is for them to abstain.
   (c) The balance of the addicted person's favourable and unfavourable attitudes.
   (d) How much effort the addicted person plans to make.
4. **The meta-analysis by McEachan *et al.* concluded that the effect of intentions was only shown if the time between intention and behaviour was less than about:**
   (a) 2 weeks.
   (b) 5 weeks.
   (c) 8 weeks.
   (d) 12 weeks.

Applying theories of behaviour change to addiction: Prochaska's model

1. **In the preparation stage of the model, the client is:**
   (a) Thinking seriously about tackling their addiction.
   (b) Ready to change their behaviour in the next month.
   (c) Working hard to avoid relapsing into addiction.
   (d) Developing the skills needed to cope with stress and anxiety.
2. **The best way to help someone in the contemplation stage is to:**
   (a) Offer them an eight-session course of CBT.
   (b) Praise them for beating their addiction.
   (c) Focus on avoiding relapse.
   (d) Get them to see how the benefits of overcoming their addiction outweigh the costs.
3. **The six-stage model recognises that:**
   (a) People work through the stages of change at the same rate.
   (b) Overcoming addiction is a dynamic process over time.
   (c) CBT is effective at every stage of the process.
   (d) Someone is 'recovered' when they stop taking drugs.
4. **According to critics, the stages in the model are:**
   (a) Completed by the addicted person in a strict order one at a time.
   (b) All essential for successfully overcoming an addiction.
   (c) Divided up arbitrarily.
   (d) All qualitatively different from each other.

MCQ answers

Describing addiction 1C, 2B, 3A, 4C
Risk factors in the development of addiction 1C, 2C, 3B, 4D
Explanations for nicotine addiction: Brain neurochemistry 1B, 2A, 3B, 4D
Explanations for nicotine addiction: Learning theory 1D, 2C, 3B, 4C
Explanations for gambling addiction: Learning theory 1A, 2C, 3A, 4D
Explanations for gambling addiction: Cognitive theory 1D, 2C, 3C, 4B
Reducing addiction: Drug therapy 1C, 2C, 3A, 4B
Reducing addiction: Behavioural interventions 1C, 2D, 3C, 4B
Reducing addiction: Cognitive behaviour therapy 1A, 2C, 3B, 4B
Applying theories of behaviour change to addiction: Theory of planned behaviour 1B, 2A, 3A, 4B
Applying theories of behaviour change to addiction: Prochaska's model 1B, 2D, 3B, 4C

References

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Chapter 1

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological Review, 84,* 191–215. ▶ page 13

Bandura, A. and Walters, R. H. (1963). *Social Learning and Personality Development*. New York: Holt, Rinehart and Winston. ▶ page 12

Bandura, A., Ross, D. and Ross, S. (1961). Transmission of aggression through imitation of aggressive role models. *Journal of Abnormal and Social Psychology, 63,* 575–582. ▶ page 12

Braver, T. S., Cohen, J. D., Nystrom, L. E., Jonides, J., Smith, E. E. and Noll, D. C. (1997). A parametric study of prefrontal cortex involvement in human working memory. *Neuroimage, 5,* 49–62. ▶ page 14

Bugelski, B. R. and Alampay, D. A. (1962). The role of frequency in developing perceptual sets. *Canadian Journal of Psychology, 15,* 205–211. ▶ page 15

Cipriani, A., Furukawa, T. A., Salanti, G., Chaimani, A., Atkinson, L. Z. ...and Geddes, J. R. (2018). Comparative efficacy and acceptability of 21 antidepressant drugs for the acute treatment of adults with major depressive disorder: a systematic review and network meta-analysis. *The Lancet, 391* (10128), 1357–1366. ▶ page 17

Cumberbatch, G., Wood, G. and Littlejohns, V. (2001). *Television: The Public's view 2000*. London: ITC. ▶ page 13

Freud, S. (1909/1977) *Analysis of a phobia in a five year old boy (Little Hans) The Pelcian Freud Library, Volume 8,* Hammondsworth: Penguin. ▶ pages 8, 18, 19, 21

Pavlov, I. P. (1927). *Conditioned Reflexes*. London: Oxford University Press. ▶ page 10

Skinner, B. F. (1953). *Science and Human Behaviour*. New York: MacMillan. ▶ pages 10, 11

Stein, C. J. and Test, M. A. (1980). Alternative to mental hospital treatment program and clinical evaluation. *Archives of General Psychology, 37,* 392–397. ▶ page 23

Watson, J. B. (1913). Psychology as the Behaviourist views it. *Psychological Review, 20,* 158–177. ▶ pages 8, 10

Wong, D. (2008). *Five creepy ways video games are trying to get you addicted*: http://www.cracked.com/article_18461_5-creepy-ways-video-games-are-tryingto-get-you-addicted.html [Accessed September 2020] ▶ page 11

Chapter 2

Aschoff, J. and Wever, R.A. (1976). Human circadian rhythms: a multioscillator system. *Federation Proceedings, 35,* 2326–2332. ▶ page 46

Banerjee S., Bentley P., Hamady M., Marley S., Davis J., Shlebak A., Nicholls J., Williamson D. A., Jensen S. L., Gordon M., Habib N., Chataway J. (2014). Intra-arterial immunoselected CD34+ stem cells for acute ischemic stroke. *Stem Cells Translational Medicine* 3(11), 1322–30 ▶ page 43

Bezzola, L., Merillat, S. and Jancke, L. (2012). The effect of leisure activity golf practice on motor imagery: and fMRI study in middle adulthood. *Frontiers in Human Neuroscience, 6,* 67. ▶ page 43

Boivin, D. B., Duffy, J. F., Kronauer, R. E., and Czeisler, C. A. (1996). Dose-response relationships for resetting of human circadian clock by light. *Nature, 379,* 540–542. ▶ page 47

Campbell, S. S. and Murphy, P. J. (1998). Extraocular circadian phototransduction in humans. *Science, 279,* 396–399. ▶ page 50

Czeisler, C. A., Duffy, J. F. and Shanahan, T. L. (1999). Stability, precision, and near-24-hour period of the human circadian pacemaker. *Science, 25,* 2177–2181. ▶ page 47

Damiola, F., Le Minh, N., Preitner, N., Kornmann, B., Fleury-Olelg, F. and Schibler, U. (2000). Restricted feeding uncouples ...dian oscillators in peripheral tissues from the central ...suprachiasmatic nucleus. *Genes and*

DeCoursey, P.J., Walker, J.K. and Smith, S.A. (2000). A circadian pacemaker in free-living chipmunks: essential for survival? *Journal of Comparative Physiology, 186,* 169–180. ▶ page 50

Doidge, N. (2007). *The Brain That Changes Itself: Stories of Personal Triumph from the Frontiers of Brain Science*. New York: Penguin Books. ▶ page 42

Dougherty, D.D., Baer, L., Cosgrove, G. R., Cassem, E.H., Price, B.H., Nierenberg, A.A., *et al.* (2002). Prospective long-term follow-up of 44 patients who received cingulotomy for treatment-refractory obsessive-compulsive disorder. *American Journal of Psychiatry, 159,* 269–275. ▶ page 39

Draganski, B., Gaser, C., Kemperman, G., Kuhn, H.G., Winkler, J., Buchel, C. and May, A. (2006). Temporal and spatial dynamics of brain structure changes during extensive training. *The Journal of Neuroscience, 26(23),* 6314–6317. ▶ page 42

Duffy J. F., Rimmer D.W. and Czeisler C.A. (2001). Association of intrinsic circadian period with morningness–eveningness, usual wake time, and circadian phase. *Behavioural Neuroscience, 115,* 895–899. ▶ page 47

Duffy, J. F., Zitting, K. and Chinoy, E. D. (2015). Aging and circadian rhythms. *Sleep Medicine Clinics, 10*(4), 423–434. ▶ page 51

Ericsson, A., Krampe, R. and Tesch-Romer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review, 100(3),* 363–406. ▶ page 49

Fink, G. R., Halligan, P. W., Marshall, J. C, Frith, C. D., Frackowiak, R. S. J. and Dolan, R. J. (1996). Where in the brain does visual attention select the forest and the trees? *Nature, 382*(6592), 626–628. ▶ page 41

Folkard, S., Hulme, K.I., Minors, D.S., Waterhouse, J. M. and Watson, F. L. (1985). Independence of the circadian rhythm in alertness from the sleep/wake cycle. *Nature, 313,* 678–679. ▶ page 46

Folkard, S., Monk, T. H., Badbry, R. and Rosenthall, J. (1977). Time of day effects in school children's immediate and delayed recall of meaningful material. *British Journal of Psychology, 68(1),* 45–50. ▶ page 46

Gopnik, A., Meltzoff, A. N. and Kuhl, P.K. (1999). *The Scientist in the Crib: Minds, Brains and How Children Learn*. New York: William Morrow and Co. ▶ page 42

Gupta, S. (1991). Effects of time of day and personality on intelligence test scores. *Personality & Individual Differences, 12(11),* 1227–1231. ▶ page 46

Holland A. L., Fromm, D. S., DeRuyter, F. and Stein, M. (1996). Treatment efficacy for aphasia. *Journal of Speech, Language and Hearing Research, 39*(5), S27–S36. ▶ page 41

Holzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., Gard, T. and Lazar, S. W. (2011). Mindfulness practice leads to increases in regional grey matter density. *Psychiatry Research, 191,* 36–43. ▶ page 43

Hood, B., Bruck, D. and Kennedy, G. (2004). Determinants of sleep quality in the healthy aged: the role of physical, psychological, circadian and naturalistic light variables. *Age and Ageing, 33*(2), 159–165. ▶ page 51

Kingstone, A., Enns, J. T., Mangun, G. R. and Gazzaniga, M. S. (1995). Guided visual search is a left-hemisphere process in split-brain patients. *Psychological Science,* 6(2), 118–121. ▶ page 41

Kleitman, N. (1969). Brain rest activity cycle in relation to sleep and wakefulness in Kales, A. *Sleep, Physiology and Pathology*. Philadelphia: Lippincott, 33–38. ▶ page 49

Knutsson, A. (2003). Health disorders of shiftworkers. *Journal of Occupational Medicine, 53,* 103–108. ▶ page 47

Lashley, K.S. (1950). In search of the engram. *Society of Experimental Biology Symposium 4,* 454–482. ▶ page 39

Lazar, S. W., Kerr, C.E., Wasserman, R. H., Gray, J.R., Greve, D.N., Treadway, M.T., McGarvey, M., Quinn, B.T., Dusek, J.A., Benson, H., Rauch, S.L., Moore, C.I. and Fischl, B. (2005). Meditation experience is associated with increased cortical thickness. *Neuroreport, 16,* 1893–1897. ▶ page 43

Luck, S. J., Hillyard, S. A., Mangun, G. R. and Gazz... (1989). Independent hemispheric attentional s... visual search in split-brain patients. *Nature, 34* 543–545. ▶ page 41

Maguire, E. A., Gadian, D. G., Johnsrude, I. S., Good... Ashburner, J., Frackowiak, R.S.J. and Frith, C. D. Navigation-related structural change in the hip... drivers. *Proceedings of the National Academy o...* 2016–2020. ▶ page 42

Manning J.T., Taylor, R. P. and Taylor, B. (2001). Sec... digit ratio and male ability in sport: implication... selection in humans. *Evolution and Human Beh...* 61–69. ▶ page 53

Medina, K.L., Nagel, B.J., Park, A., McQueeny, T. an... (2007). Depressive symptoms in adolescence: as... with white matter volume and marijuana use. *J... Child Psychology and Psychiatry and Allied Disci...* 592–600. ▶ page 43

Miles, L. E., Raynal, D. M. and Wilson, M. A. (1977). E... living in normal society has circadian rhythms o... *Science, 198,* 421–423. ▶ page 51

Nielsen, J. A., Zielinski , B. A., Ferguson, M. A., Lainh... Anderson, J. S. (2013). An evaluation of the left-b... brain hypothesis with resting state functional co... magnetic resonance imaging. PLoS Biology, http... plos.org/plosone/article?id=10.1371/journal.pon... ▶ page 41

Petersen, S. E., Fox, P.T., Posner, M. I., Mintun, M. and... M. E. (1988). Positron emission tomographic studi... cortical anatomy of single-word processing. *Natu...* 585–589. ▶ page 39

Ralph, M.R., Foster, R.G., Davis, F. C. and Menaker, M.... Transplanted suprachiasmatic nucleus determines... period. *Science, 247,* 975–978. ▶ page 50

Ramachandran, V. S. and Hirstein, W. (1998). Percepti... of phantom limbs: the D.O. Hebb Lecture. *Brain, 1...* 1603–1630. ▶ page 43

Rogers L. J., Zucca P. and Vallortigara, G. (2004). Advar... having a lateralized brain. *Proceedings of the Royal... London, 271,* S420–S422. ▶ page 41

Rohan, K. J., Roecklein, K. A., Lacy, T. J. and Vacek, P. M... Winter depression recurrence one year after cognit... behavioral therapy, light therapy, or combination t... *Behaviour Therapy, 40*(3), 225–238. ▶ page 49

Sanassi, L. A. (2014). Seasonal affective disorder: Is the... at the end of the tunnel? *Journal of the American Ac... Physician Assistants, 27*(2), 18–22. ▶ page 49

Schneider, E.B., Sur, S. and Stevens, R. D. (2014). Functi... recovery after moderate/severe traumatic brain inju... *American Journal of Neurology, 82(18),* 1636–1642.

Solomon, C. M. (1993, June). Working smarter: How HR... *Personnel Journal, 72*(6), 54–64. ▶ page 47

Sperry, R. W. (1968). Hemisphere deconnection and uni... consciousness. *American Psychologist, 23,* 723–733.

Stern, K. and McClintock, M.K. (1998). Regulation of ovu... human pheromones. *Nature, 392* (6672), 177–179. ▶

Tang, Y. Y., Lu, Q., Fan, M., Yang, Y., and Posner, M.I. (201... Mechanisms of white matter changes induced by me... *Proceedings of the National Academy of Sciences of th... States of America, 109,* 1–5. ▶ page 43

Tramontin, A. D. and Brenowitz, E. A. (2000). Seasonal pl... the adult brain. *Trends in Neuroscience, 23*(6), 251–25... ▶ page 43

Tremblay, P. and Dick, A. S. (2016). Broca and Wernicke ar... or moving past the classic model of neurobiology. *Bra... Language, 162,* 60–71. ▶ page 39

Trevathan, W. R., Burleson, M. H. and Gregory W. L. (1993)... No evidence for menstrual synchrony in lesbian coupl... *Psychoneuroendocrinology, 18,* 425–435. ▶ page 49

Appendix: A level skills

Question styles



At A level you may have multiple-choice, short-answer and/or extended writing/essay questions. How do you know how to answer these? There are clues:

- The command word (see column on right)
- The number of marks
- Extra information in the question

Multiple-choice questions

Questions that require you to select the correct answer. For example:

Which of the statements below best describes the psychodynamic approach?

A All behaviour is learned. ☐

B Unconscious desires influence behaviour. ☐

C Self-concepts are important in motivating behaviour, such as self-actualisation. ☐ (1 mark)

Short-answer questions

Such questions may require description, application and/or evaluation. These questions are worth 8 marks or less.

Short-answer questions involving description

Explain what is meant by an 'exogenous zeitgeber'. (2 marks)

Identify **and** outline **two** key concepts of the humanistic approach. (2 marks + 2 marks)

Outline Bowlby's theory of attachment. (4 marks)

Describe the role of peer review. (6 marks)

Short-answer questions involving evaluation

Briefly evaluate the multi-store model of memory. (4 marks)

Explain **one** limitation of adopting a determinist approach in psychology. (3 marks)

Explain the difference between alpha bias and beta bias in psychological research. (4 marks)

Explain **two** limitations of the cognitive approach. (3 marks + 3 marks)

Short-answer questions with describe and evaluate

Outline **and** evaluate gender bias in psychology. (8 marks)

Briefly discuss the benefits of adopting a reductionist approach to the study of human behaviour. (8 marks)

Outline **and** evaluate split-brain research. (8 marks)

Examples of application questions are shown on page 390.

Longer essay questions

At A level the maximum number of marks for any extended writing question is 16. All A level extended writing/essay questions have more marks for the evaluation than for the description.

Describe **and** evaluate the nomothetic approach to explaining behaviour. (16 marks)

Discuss research in which types of long-term memory have been investigated. (16 marks)

Describe **and** evaluate ethical implications of research (theories and/or studies). Refer to social sensitivity in your answer. (16 marks)

Discuss research on biological rhythms. (16 marks)

Command words

The following command words are used in exam questions. The definitions given here are from AQA (see tinyurl.com/yx7jqjy5).

Analyse	Separate information into components and identify their characteristics.
Calculate	Work out the value of something.
Choose	Select from a range of alternatives.
Comment	Present an informed opinion.
Compare	Identify similarities and/or differences.
Complete	Finish a task by adding to given information.
Consider	Review and respond to given information.
Describe	Give an account of.
Design	Set out how something will be done.
Discuss	Present key points about different ideas or strengths and weaknesses of an idea.
Distinguish	Explain ways in which two things differ. Provide detail of characteristics that enable a person to know the difference between ...
Draw	Produce a diagram.
Evaluate	Judge from available evidence.
Explain	Set out purposes or reasons.
Explain how	Give a detailed account of a process or way of doing something.
Explain why	Give a detailed account of reasons in relation to a particular situation.
Give	Produce an answer from recall or from given information.
Identify	Name or otherwise characterise.
Justify	Provide reasons, reasoned argument to support, possibly provide evidence.
Label	Provide appropriate names on a diagram.
Name	Identify using a recognised technical term.
Outline	Set out main characteristics.
Select	Choose or pick out from alternatives.
State	Express in clear terms.
Suggest	Present a possible case/solution.
What is meant by	Give a definition.
Which is	Select from alternatives.
Write	Provide information in verbatim form.

Understanding description (AO1)

There are three main skills that you need to develop:

- **Description** of psychological knowledge, assessment objective 1 – aka AO1.
- **Application** of psychological knowledge (AO2).
- **Evaluation** of psychological knowledge (AO3).

When we say 'psychological knowledge' we are referring to the concepts, research studies, therapies and theories/explanations used and developed by psychologists.

This spread starts by looking at *description skills*. What is it you have to do when you *describe* something?

Think of describing an orange. You might say – it is round and orange – which is true but that is a rather *limited* description.

A better description would include more *detail* – The skin is a little squishy and pockmarked. The remains of the green stalk are set in a dimple.

To do well at AO1 you need to grasp this concept of *detail*.



Describing concepts

One of the concepts we have explained in this book is *alpha bias*.

This is what we have written on page 94 in relation to alpha bias:

> Psychological research that exaggerates differences is alpha-biased. Such differences are typically presented as fixed and inevitable. Sometimes these differences heighten the value of women, but more often they devalue women in relation to men.

If you were asked to **outline** this concept you might write:

'Alpha bias refers to exaggerating differences.'

This is a basic answer which is accurate.

A good answer needs to be detailed and have clarity and coherence.

'Alpha bias refers to research (theories or studies) that exaggerate differences. Sometimes these differences heighten the value of women, but more often they devalue women in relation to men.'

If you were asked to **explain** this concept you might include an example:

'... for example, Freud's theory of psychosexual development suggests that women are morally inferior to men because the resolution of the phallic stage is less dramatic.'

Describing research studies

Psychology is a science and therefore psychologists seek evidence to support their views. This evidence comes from research studies.

You should be able to describe such studies, for example:

> Outline **one** study in which circadian rhythms have been investigated.

When *describing* a study it is always wise to provide details of what the researcher(s) did (the procedure – 'how' questions) **and** what was found (the findings – 'show' questions).

A good answer should be accurate, detailed and have clarity and coherence.

A special note about research studies

When describing a research study you do not have to include researchers' names but it does provide useful detail. It also ensures that the reader knows which study you are describing – otherwise you might not perform so well because your answer does not appear to apply to a specific study.

Don't worry too much about exact dates.

Another special note about research studies

Research studies may also be used as evaluation – when they are being used in this way you will not be credited for details of the procedure. More about this on page 392.



Timing

On A level exams, there are 96 marks for each paper and 120 minutes.

This gives you a sense of how much time you should spend on each exam question.

Don't forget that this timing is not just about writing but you should spend time thinking too.

Description questions use these command words:

Outline

Describe

Explain

Identify

Name

State



Every time you make a point, make sure you also explain it.

Describing theories/explanations

Such questions look like this:

Explain the process of synaptic transmission. (4 marks)

Describe the cognitive approach in psychology. (6 marks)

In these questions, as with all other questions, there is no *one* answer. A good answer is one that is **accurate**, **detailed** and **has clarity** and **coherence**.

In addition, for longer answer questions **organisation** and **use of specialist terminology** are important.

The mark for any answer is determined by what *descriptors* (in the table below) best represent what a student has written (bearing in mind the amount of time available to write your answer). The appropriate *level* can then be determined.

A student does not have to fulfil *all* the criteria in a particular level – it is the level that best describes the answer.

Once the level is identified, the mark is determined by considering whether the assessor is tempted by the level above or below.

AO1 Mark scheme

In this mark scheme you can see the key descriptors that we identified above.

Level	Marks	Description
3	5–6	Knowledge is accurate and generally well-detailed. The answer is clear and coherent. Specialist terminology is used effectively.
2	3–4	Some knowledge is present but there may be some detail missing/lack of clarity. There is some appropriate use of specialist terminology.
1	1–2	Knowledge is limited. The answer as a whole lacks clarity/accuracy. Specialist terminology is either absent or inappropriately used.
	0	No relevant content.

The mark scheme is presented as an illustration of the AQA mark scheme. Always check the AQA website for the latest version of mark schemes as these may have been amended.

Research

If asked to 'Describe research related to conformity' then you can either describe research studies or concepts or theories.

Concepts and theories are derived from the research process and therefore constitute research.

What do these terms mean?

What is *accuracy*?

Being correct. You are not *necessarily* penalised for inaccuracy but you should avoid muddled or confused answers. Aim to present material that is correct.

What is *detail*?

Providing specific pieces of information. This does not always mean writing lots. Instead it means including the small pieces of information that really bring your answer into focus. For example:

Internalisation is when a person changes their opinions in their own mind.

Internalisation is when a person changes private as well as public opinions.

The second answer is more detailed and the same number of words.

What is *organisation*?

You know what an organised bedroom looks like. No doubt some of you do not have very organised bedrooms and often have to search high and low to find things. Teachers reading student answers often feel like this.

Put the information in your answer so that each point follows the previous one in a systematic way rather than just dumping everything you know onto the page – a teacher can see the mess.

In longer answer questions it is important to have a plan and a structure (see page 396).



What is *clarity* and *coherence*?

One of the major issues for people who read what you write is that it doesn't always make sense. Lack of clarity is when you don't quite understand what the person is trying to say.

One useful way to ensure clarity (and coherence) is to always try to explain what you have just written, for example using the phrase 'in other words' to make your meaning clear:

Internalisation is when a person changes their private as well as public opinions. In other words they actually believe the views they are expressing.

What is *specialist terminology*?

This is linked to 'detail' – using psychologists' specialist terms provides specific information for your answers.

What are these specialist terms? They are the vocabulary used by psychologists for their concepts and theories, such as the term *identification*.

Specialist terms may be words that are used in ordinary English but they have been given a specific meaning in psychology – like *computer model* or *social sensitivity*.

Or they may be terms that are new to you, such as *zeitgeber* or *parametric*. Get used to using these.

Understanding application (AO2)

We will now move on to the second skill – *application*.

The trick of the application questions is that you are required to *apply* what you have learned about psychological concepts, studies and theories – to a **scenario**.

Imagine the following scenario ...

... it is a dark night, a thin sliver of moon and ink black clouds, the wind is starting to get stronger. You walk home down a street with no lights and suddenly ...

A scenario is a scene – it's context. You now have a chance to put your psychology into action. This kind of question is intended to be something that tests your real understanding of psychology.

You should become brilliant at this because we have supplied lots and lots of practice throughout this book.



Wrong sort of dark night! A different scenario altogether ...

Apply it Concepts

In Chapter 2 we discuss ways of studying the brain.

> A team of neuroscientists want to know whether the brain areas that are active when someone is lying can be identified from brain scans. They have been given funding from an American company who are keen to develop technology that could be used as evidence to show whether defendants are, or are not, telling the truth in court cases. The neuroscientists have decided to use fMRI scans as part of their research to see whether lying is localised in the brain.
>
> Explain how fMRI could be used to investigate whether lying is localised in the brain. (*6 marks*)

The description of the event is the 'scenario' (also sometimes referred to as the 'stem'). It provides a context for you to answer the question. When doing this you must include:

1. **CONCEPT** You must describe how fMRI works.
2. **CONTEXT** You must relate your description to the specific issue of how fMRI might be used to identify areas of the brain that could be active when someone is lying.

Some scenarios (and questions) are shorter. For example, in Chapter 13 we discuss treatments for addiction.

> Trevor is long-term heavy smoker. Explain how Trevor's nicotine addiction could be treated using aversion therapy. (*4 marks*)

1. **CONTEXT** You must relate your description to the specific issue of how aversion therapy could be used to treat Trevor's addiction to nicotine.
2. **CONCEPT** You must describe how aversion therapy works.

AO2 Mark scheme

These are the levels that may be used when marking an application question. Identify the key descriptors.

Level	Marks	Description
3	5–6	Application of knowledge is mostly clear, effective and well-detailed. The answer is generally coherent with appropriate use of terminology.
2	3–4	Application of knowledge is evident with some effectiveness. The answer lacks clarity in places. Terminology is used appropriately on occasions.
1	1–2	Application of knowledge is limited. The answer as a whole lacks clarity and has inaccuracies. Terminology is either absent or inappropriately used.
	0	No relevant content.

Apply it Methods

About 25% of your exam questions will assess skills in relation to research methods. These questions are mainly application questions that begin with a scenario as shown below:

> A psychologist wanted to investigate the memory of older and younger children. He tested memory by giving the children a list of 50 words to memorise.
>
> 1. Explain why this study would be considered to be a quasi-experiment. (*2 marks*)
> 2. Write a suitable hypothesis for this study. (*2 marks*)
> 3. The researcher found that the mean score for older children was 20.3 and for younger children was 15.7. What would you conclude from this? (*1 mark*)
> 4. The mean scores are given to 1 decimal place. Explain what this means. (*1 mark*)

The description of the research study is the scenario. It again provides the context for your answer.

For example, when studying research methods you will learn about quasi-experiments. You now use that knowledge in the context of this research study.

In the case of question 1 above this is likely to consist of:

- 1 mark for an explanation of the concept.
- 2 marks for an explanation of the concept plus content related to the stem.

There are marked examples on pages 88–89.

The mark scheme is presented as an illustration of the AQA mark scheme. Always check the AQA website for the latest version of mark schemes as these may have been amended.

Mathematical content for A level

A minimum of 10% of marks across the whole qualification will involve mathematical content (this content is listed on the right). This 10% is included in the total 25% (or more) for research methods questions.

Some of the mathematical content requires the use of a calculator, which is allowed in the exam. In the specification it states that calculations of the mean, median, mode and range may be required, as well as percentages, fractions and ratios. You may also be asked to apply the Sign test to a set of data and calculate the statistic. You will not be asked to calculate any of the statistical tests covered in this Year 2 book.

All mathematical content is covered in our Year 1 book.

	Mathematical concepts	*Tick here when you are confident you understand this concept.*
Arithmetic and numerical computation	Recognise and use expressions in decimal and standard form.	
	Use ratios, fractions and percentages.	
	Estimate results.	
Handling data	Use an appropriate number of significant figures.	
	Find arithmetic means.	
	Construct and interpret frequency tables and diagrams, bar charts and histograms.	
	Understand simple probability.	
	Understand the principles of sampling as applied to scientific data.	
	Understand the terms mean, median and mode.	
	Use a scattergram to identify a correlation between two variables.	
	Use a statistical test.	
	Make order of magnitude calculations.	
	Distinguish between levels of measurement.	
	Know the characteristics of normal and skewed distributions.	
	Select an appropriate statistical test.	
	Use statistical tables to determine significance.	
	Understand measures of dispersion, including standard deviation and range.	
	Understand the differences between qualitative and quantitative data.	
	Understand the difference between primary and secondary data.	
Algebra	Understand and use the symbols: $= \ < \ << \ >> \ > \ \propto \ \approx$	
	Substitute numerical values into algebraic equations using appropriate units for physical quantities.	
	Solve simple algebraic equations.	
Graphs	Translate information between graphical, numerical and algebraic forms.	
	Plot two variables from experimental or other data.	

Other research methods questions

Many research methods questions are application. But not all.

Description

Some research methods questions are just description. For example:

Explain how you would collect a volunteer sample. (2 marks)

If the question said 'Explain how you would collect a volunteer sample in this study' then it would require additional application.

Evaluation

Some research methods questions are evaluation. For example:

*Give **one** strength of using a volunteer sample. (2 marks)*

If the question said 'Give **one** strength of using a volunteer sample in this study' then it would require additional application.

Mathematical content

There is a special focus on mathematical content in each chapter on the 'Practical corner' spreads.



Remember:

Concept Context

or

Context Concept

Understanding evaluation (AO3)

We finally move onto the third skill – *evaluation*.

What is it you have to do when you *evaluate* something?

Think of the orange again (picture on right to help you). How can you evaluate an orange? Most people are puzzled by such a question.

Evaluation means 'consider its value' (eVALUatE). No, the answer is not 30p.

You might say – it is great to take an orange in your bag for lunch because it doesn't get damaged.

That's an advantage/strength of an orange.

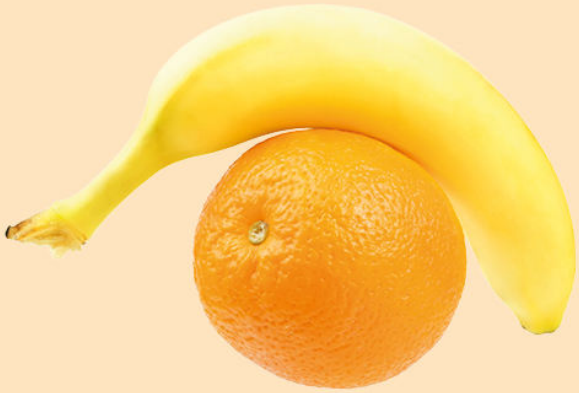
You might also say – I don't like oranges because my hands get all sticky.

That's a disadvantage/limitation of an orange.

You could *elaborate* your answer by making a comparison – I don't like oranges because my hands get all sticky whereas they don't get so sticky with a banana.

Understanding elaboration is what it is all about.

AO3 is a bit more than evaluation. It also means to analyse and interpret. To analyse an orange you might consider what it is made of. Furthermore it involves discussion, considering both sides of an argument.



Beginner level evaluation: State the point

There are many different kinds of evaluation, as you will discover in this book. For example, research support for a theory is a strength whereas lack of research support is a limitation. High validity is a strength and low validity is a limitation.

To evaluate a concept, study or theory you might say:

This concept is supported by research.
This study has been supported by other studies.
This study was well-controlled.
This study had a limited sample.
This theory lacks validity.

You have identified the evaluation, which is a beginning! Some students don't ever get much beyond this – and have to rely on their AO1 marks.

It's too easy just to state these rather *generic* criticisms, i.e. comments that can be used anywhere. But it is a beginning. So don't feel too bad if that is all you can do for a while.

Intermediate level evaluation: Make it relevant

The next step is to make your evaluation relevant to the particular concept/study/theory. You need to say something to make your evaluation unique rather than generic.

For example:

- *This concept is supported by research. Elliott* et al. *also found that men were more conformist than women, using a British rather than American sample.*
- *This study had a limited sample. The investigation only involved five people and they were friends of the researcher.*

In the case of the evaluation below – it may look good but it is still generic (and therefore not worth much):

This study was well-controlled. All important extraneous variables were monitored so that only the independent variable affected the dependent variable.

You can drop that evaluation in almost anywhere and it will make sense.

Higher level evaluation: Explain it well

When you have mastered intermediate level, it is time to move on – but don't do this until you have mastered the intermediate level. Don't run before you can walk.

There are many ways to explain your evaluation point:

- You can use examples.
- You can elaborate on what you have said already.
- You can end by explaining why your point is a strength or limitation.

ENDINGS

Always finish with a conclusion – this is not a summary, it is a judgement. It is useful to use phrases such as:

This suggests ... This shows that ... This means ... Therefore ...

Always end with a sentence beginning with T (of course it doesn't have to be a T but that is a useful prompt, just start writing 'This shows ...').

Look at any of the evaluation points in this book. We have tried to ensure that all our evaluation points follow the same rule:

State the point.

Make it relevant and explain the point with reference to theories or research studies.

End with a conclusion (This suggests that ...).

Evaluation questions mainly use these command words:
Evaluate
Discuss

There are other command words that also indicate evaluation, such as analyse, compare, justify, comment on.

Some marked examples

Question: Discuss **one** limitation of adopting a determinist approach to explaining human behaviour. (3 marks)

One limitation is that a determinist approach is not how our legal system works because people in court are seen as responsible for their actions. If determinism can't be applied to everyday life then it is artificial and lacks ecological validity.

Teacher comment: Here you would first be expected to identify the limitation, which has been done. You should also aim to include additional information about the limitation, including an explanation about why this is a limitation. There has been some attempt to do this (can't apply to real life) but it is very generic so not very effective.

Question: Briefly evaluate Sperry's split-brain research as a way of investigating hemispheric lateralisation. (4 marks)

Sperry's research was highly controlled and all the split-brain patients followed the same procedures. For instance, an image or word could be projected to a patient's right eye (processed by the left half of the brain) and the same, or different, image could be projected to the left eye (processed by the right half of the brain). The patients had to describe what they could see. Another issue was that the number of participants was small, only about 10 of them.

Teacher comment: If a question just asks for evaluation you can present strengths and/or limitations. There is no requirement for balance and no specific number of evaluation points is required. The answer above covers two points of evaluation that are both relevant but not very effective – the descriptive content about Sperry's research is not an explanation of the first evaluation point. In this way the answer has lost focus. The second evaluation point is rather brief and could have been developed further. The explanations are limited and little specialist terminology has been used.

AO3 Mark scheme

The descriptors that may be used to mark a 4-mark AO3 question:

Level	Marks	Description
2	3–4	Evaluation is well-explained and focused, rather than generic criticism. The answer is mostly coherent. Specialist terminology is used appropriately.
1	1–2	Evaluation is limited/muddled or outlined only. Specialist terminology is absent or inappropriately used.
	0	No relevant content.

The mark scheme is presented here as an illustration of the AQA mark scheme. Always check the AQA website for the latest version of mark schemes as these may have been amended.

Question: Evaluate the humanistic approach. (6 marks)

A strength is the approach portrays a positive image of the human condition – seeing people as in control of their lives and having the freedom to change. Freud saw human beings as prisoners of their past and claimed all of us existed somewhere between 'common unhappiness and absolute despair'.

A limitation of humanistic psychology is that it may be culturally biased. The key concept of self-actualisation may be more relevant to individualist rather than collectivist cultures because they focus on the needs of the group not promoting individual development. This means that, for example, applying this to mental health may not be appropriate.

Teacher comment: In an evaluation question of this length you probably need to present more than one evaluation. There is a trade-off between writing a few evaluations and having time for great explanation, or writing more evaluations but then less explanation. The two evaluations covered here are both effective, well-explained, focused, organised and there is evidence of specialist terminology.

AO3 Mark scheme

The descriptors that may be used to mark a 6-mark AO3 question:

Level	Marks	Description
3	5–6	Evaluation is thorough and effective. The answer is clear, coherent and focused. Specialist terminology is used effectively.
2	3–4	Evaluation is evident but there are occasional inaccuracies/ omissions. The answer lacks clarity in places. Specialist terminology is used appropriately on occasions.
1	1–2	Evaluation is limited. The answer lacks clarity and organisation. Specialist terminology is either absent or inappropriately used.
	0	No relevant content.

The mark scheme is presented here as an illustration of the AQA mark scheme. Always check the AQA website for the latest version of mark schemes as these may have been amended.

What do these terms mean?

What is *effective*?

Essentially 'effective' means something that works, such as 'an effective treatment for malaria'.

An effective evaluation point is therefore one that works – it should not be generic.

What is *generic*?

The word 'generic' means 'general'. In the context of making evaluations it refers to that nice little list of all-purpose comments, 'This study lacked validity', 'This theory is culturally-biased', etc.

Such all-purpose criticisms can be scattered everywhere and require little understanding. Anyone can do that.

Some generic evaluations can be quite lengthy. For example, 'One problem with this research is that it is quite artificial. It was conducted in a laboratory where things are not like they are in everyday life. This makes it difficult to generalise the findings to everyday experience and makes the research worthless.'

Such a comment can be put in many essays with no attempt to make it specifically relevant – and therefore it isn't very effective.

What is *well-explained*?

'Explain' means offer some further information to help the reader understand what you are saying. This may include providing more relevant facts, offering an interpretation ('This means that...'), justifying the point you are trying to make, and so on.

Maybe think of the difference between someone asking you to tell them what you did last night and them asking you to *explain* what you did last night. Hmm.

What is *focus*?

If you focus on an image, you concentrate your attention on that one thing. The same is required for good evaluation. You need to pay attention just to the study or theory you are evaluating rather than making general remarks.

One issue related to focus is that students often *describe* material (such as describing the procedures of a study) instead of explaining the evaluation point. They lose focus.

Using research studies as evaluation

On page 388 we noted that you may present information about a research study as part of your descriptive content – but you can also use research studies as evaluation.

If you do this then it is really only the findings/conclusion that can be considered as AO3. Description of procedure might be classed more as description (AO1).

Essay questions

The final kind of question for us to consider is the essay question (AKA an *extended writing question* when worth 16 marks) – where you are required to include both description (AO1) and evaluation (AO3) and sometimes also application (AO2).

Examples of such questions are shown on the right.

Notice:

- The command words vary.
- Essay questions at A level are likely to be a maximum of 16 marks – on such questions the balance of marks is likely to be 6 marks for AO1 and 10 marks for AO3 except if there is application. Then the marks are 6 marks for AO1, 4 marks for AO2 and 6 marks for AO3.
- One of the questions on the right includes some application material.
- One question asks specifically for studies, others concern theories/explanations and there is also one that just mentions research (so theories or studies would be acceptable). 'Study' essays are only likely where the study is named in the specification.
- Questions sometimes say 'one or more'. This means that you could produce an effective answer if you only discuss one study/theory but you can do more if you wish.

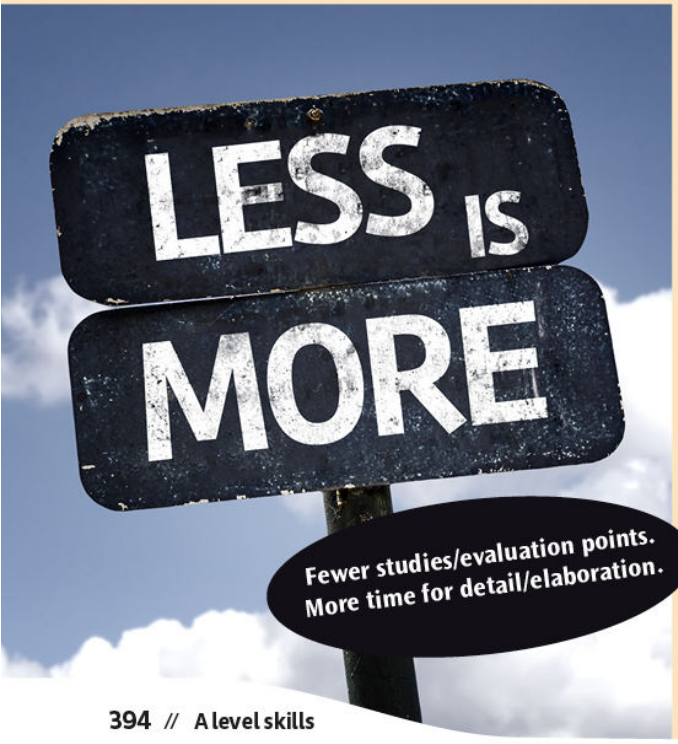
At the end of each chapter in this book are some student answers to practice questions, including answers for essay questions.

- *Briefly discuss **one** explanation for depression.* *(8 marks)*
- *Outline **and** evaluate Maslow's hierarchy of needs.* *(8 marks)*
- *Discuss **one or more** Romanian orphan studies.* *(16 marks)*
- *Describe **and** evaluate theories of romantic relationships.* *(16 marks)*
- *Describe **and** evaluate research related to biological rhythms.* *(16 marks)*
- *Describe **and** evaluate the nature–nurture debate in psychology. Refer to examples from your study of psychology.* *(16 marks)*
- *Gary is often in trouble at school and has been suspended for bullying his classmates. Both of his older brothers were excluded from school for injuring other children. His teachers have described Gary as 'following in his brothers' footsteps'.*

  Discuss the free will and determinism debate in psychology. Refer to the experiences of Gary in your answer. *(16 marks)*

Some useful lead-in phrases for AO3

An application is …
This means that …
On the other hand …
One strength is …
One limitation is …
This shows that …
In contrast …
However …



Essays on research studies

In a question on research studies, just one or two studies may be enough. It's about quality rather than quantity.

Essays with application material

These questions include application in addition to the usual describe and evaluate elements of an essay question.

You are required to make appropriate links between the theory and the scenario (stem) presented. If you do not do this you will not have fully answered the question.

Partial performance

Some questions ask for two things. For example, 'Outline **and** evaluate **two** definitions of abnormality. (16 marks)'

In such an essay if you only describe and evaluate one definition, this is called 'partial performance'. You have only answered half of the question.

What do students do wrong in essays?

- Students give too much description, not enough well-explained evaluation.
- Students fail to make their evaluation effective – use AO3 lead-in phrases (see examples above left) to make it clear when you are presenting evaluation.
- Students fail to answer the question – take time to plan your answer to focus on what will be creditworthy. If you just start writing your answer you may forget the focus of the question so it pays to do some planning. It may also help, as you start each new paragraph, to go back to the title to remind yourself what the essay should be about.
- Students do not use paragraphs – which makes the essay very difficult to read. 'Organisation' is one of the criteria by which you are assessed so it will affect the overall impression of the essay.

Discuss idiographic and nomothetic approaches in psychology. (*16 marks*)

Vladimir's answer	Teacher comments
The idiographic approach is focused on people as unique individuals. It uses methods that produce qualitative data such as case studies and unstructured interviews, for example Freud's analyses of his patients, and these give a good insight into thoughts and behaviour.	This short opening paragraph contains relevant information but the aims of the idiographic approach are not adequately explained. Vladimir could have gone much further in his description here.
The main aim of the nomothetic approach is to produce general laws of human behaviour. These can then be used, for example, to develop drug therapies which are then applied to individuals. The nomothetic approach is most associated with methods that would be classed as 'scientific' in psychology, such as experiments and structured questionnaires and psychological tests. Using these methods large numbers of people and responses are compared to draw general conclusions, such as in word recall experiments or IQ testing.	In comparison, the material on the nomothetic approach is much more successful. The aims of the nomothetic approach are clearly stated and there are appropriate examples of how this approach has been used in psychological research. These first two paragraphs cover the descriptive content of the answer, though subsequent evaluation paragraphs contain further evidence of knowledge. Vladimir has put more effort into the evaluation which is probably a good strategy.
One strength of both approaches is that together they increase our understanding. The idiographic approach gives us details of individuals so we can have a deeper understanding. This can create hypotheses which are studied in a more nomothetic way e.g. using experiments to test hypotheses or large-scale questionnaires to test some of the ideas.	In paragraphs 3 and 4 an evaluation point and counterpoint are given which might have been improved using specific research examples. But the explanations are effective and the two paragraphs form a nice 'discussion', an important feature of AO3.
However the idiographic approach on its own may lack meaning without the backup of nomothetic research. Idiographic methods are subjective and there is no baseline against which to compare behaviour.	
For instance, HM was studied by psychologists and neuroscientists until his death in 2008. Following surgery to treat severe epilepsy, HM developed anterograde amnesia. He could not commit newly learned facts or events to long-term memory but his short-term memory, and memory for events before the surgery, remained intact. This research has provided useful insights for understanding memory processes.	Paragraph 5 is rather unfocused. Vladimir could have made this relevant by using the case of HM as part of an analysis of the evaluation point presented above. On its own though, this does not constitute effective discussion.
Methods associated with the idiographic approach, such as case studies, tend to be the least scientific in that conclusions often rely on the subjective interpretation of the researcher and, as such, are open to bias. But the triangulation method offers a way to overcome this by comparing results from different kinds of research, so validity can be increased.	Paragraph 6 offers a better evaluation point than the material presented above. It's well-explained but needs more elaboration.
The processes involved in nomothetic research tend to be similar to those used in the natural sciences. This includes testing under standardised conditions, using data sets of group averages, statistical analysis and control, for example in the field of IQ testing. This has enabled psychologists to establish norms of 'typical' behaviour (such as the average IQ of 100), which gives psychology greater scientific credibility.	In the penultimate paragraph Vladimir uses a well-chosen example – that of IQ testing – to successfully convey the point about the scientific credibility of the nomothetic approach. This is well-argued and thorough. The final paragraph is well-explained – using an appropriate example as before and a tentative attempt to compare the two approaches. This could have been developed further, perhaps leading to a general conclusion about how both approaches have their place in psychology.
However, the nomothetic approach has been accused of 'losing the whole person' within psychology. Knowing that there is a 1% lifetime risk of developing schizophrenia tells us little about what life is like for someone who has been diagnosed with the disorder. That would be better coming from a more descriptive idiographic approach. *440 words*	Vladimir's answer is mostly clear and well-organised. It is reasonably balanced (considerably more evaluation/discussion than description as required in an A level answer). The quality of the evaluation/discussion is, overall, edging towards 'mostly effective'. There are some good attempts at discussion and at making the points thorough – but this is not true of all points.

Mark scheme used for essay questions

In a 16-mark essay where there are 6 marks AO1 and 10 marks AO3.

! Note that this mark scheme differs from the AS mark scheme in one key aspect – the term 'discussion' is often used instead of 'evaluation', suggesting that a more discursive approach to AO3 is desirable at this level.

Level	Marks for A level	Description
4	13–16	Knowledge is accurate and generally well-detailed. Evaluation/discussion is thorough and effective. Minor detail and/or expansion of argument is sometimes lacking. The answer is clear, coherent and focused. Specialist terminology is used effectively.
3	9–12	Knowledge is evident. There are occasional inaccuracies/omissions. Evaluation/discussion is mostly effective. The answer is mostly clear and organised but occasionally lacks focus. Specialist terminology is mostly used effectively.
2	5–8	Limited knowledge is present. Focus is mainly on description. Any evaluation/discussion is of limited effectiveness. The answer lacks clarity, accuracy, organisation and focus in places. Specialist terminology is used inappropriately on occasions.
1	1–4	Knowledge is very limited. Evaluation/discussion is limited, poorly focused or absent. The answer as a whole lacks clarity, has many inaccuracies and is poorly organised. Specialist terminology is either absent or inappropriately used.
	0	No relevant content.

To decide on a mark identify the level that best describes the essay, and then consider whether you are more tempted by the level above or below to determine the exact mark to award. Always check the AQA website for the latest version of mark schemes as these may have been amended.

Applying Psychology to successful studying

There are probably two big challenges ahead for you:

1. Writing essays.
2. Learning all the material in this book.

The suggestions on this spread are informed by psychological research – after all, we are psychologists.

Start by considering the descriptive component of your essay. The most you will need is 6 marks' worth of description (AO1). If you identify about six key points that will help you structure your answer (the subheadings in this book will help you). We have done this for an essay on the psychodynamic approach.

Select any essay title in this book, produce an empty frame like the one on the right and fill it in for the description component. Don't add more – you won't need it ... ever!

Writing frame for an essay

AO1 Key point	Description
Unconscious	We are aware of our conscious mind, but it is the tip of the iceberg. The unconscious stores biological drives and instincts and also memories, accessed through dreams.
Tripartite	The Id is the primitive part driven by the pleasure principle. The Ego mediates between the Id and Superego, driven by the reality principle. The Superego (phallic stage) is driven by the morality principle.
Psychosexual stages	Each stage is marked by a different conflict that the child must resolve to move on to the next stage. Unresolved conflicts lead to fixations.
Fixed sequence	Oral (0–1 years), anal (1–3), phallic (3–6), latency (earlier conflicts repressed), genital (puberty).
Oedipus complex	In the phallic stage, boys desire their mother and hate their father. Later they identify with the father and take on gender role and morals. Girls experience penis envy.
Defence mechanisms	Unconscious strategies such as repression (distressing memories put in unconscious) and displacement (transferring true feelings).

There are about 150 words here which is about right for the AO1 content of an essay.

Now do the same for the evaluation (AO3). To plan your evaluation the organisation of the writing frame is a bit different. On page 392 we explained that good evaluation points start with the basics, and then you may add further elaboration (intermediate and higher level). The table below will help you plan this.

NOTE For an A level essay the maximum is 10 marks of AO3 – about 300 words, probably three or four clearly explained points.

AO3 Key point	Intermediate level evaluation	Higher level evaluation
Real-world application.	This was the first attempt to treat mental disorders psychologically using psychoanalysis. This therapy can deal with everyday problems and access unconscious using e.g. dream analysis.	Psychoanalysis has been the forerunner to modern-day 'talking therapies' (e.g. counselling).
Counterpoint (limited therapy/ theory).	However psychoanalysis may only be appropriate for mild neuroses and not for more serious mental disorders such as schizophrenia.	People with schizophrenia lose their grip on reality, so cannot articulate their thoughts.
Explanatory power.	Theory has had a large influence on contemporary thought. Used to explain wide range of behaviours (e.g. mental disorders).	It also played an important part in understanding the role of early childhood experience.
Untestable concepts.	Popper (philosopher of science) claims Freud's theory cannot be falsified (disproved), a key criterion of science. For example, the Id acts at an unconscious level and is difficult to test.	Furthermore Freud's ideas were based on subjective research, such as with Little Hans.

There are about 160 words here – in the exam your task is to carefully explain each point (elaboration) and add a conclusion (no need to record the conclusion in your notes).

Some students may consider a further evaluation point and even offer a discussion.

Psychic determinism.	All behaviour is determined by unconscious conflicts rooted in childhood. Even something as random as a 'slip of the tongue' is driven by unconscious forces.	But others suggest that this is an extreme view because it dismisses any influence of free will, an important concept for the legal system (people do have responsibility i.e. free will).

Some essays also involve some application (AO2) – see an example on page 394. If you are answering an essay like this you must remember to make links to the context (stem) throughout your answer and reduce the number of evaluation points (in a 16-mark application essay, there are 6 marks not 10 marks for AO3).

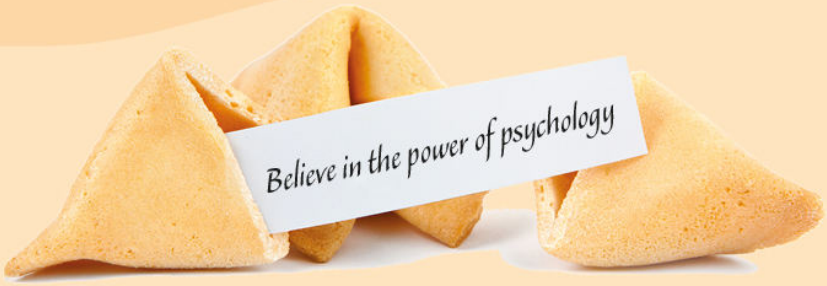
Remember ... less is more. That is the way to improve performance.

The psychology behind writing frames is called **scaffolding**. Psychologists use this term to describe the process where a person needs support in the early stages of learning to do something new.

The idea is that, when you are ready, you kick away the scaffold, and – hey presto – you can do it on your own.

Not a good idea if you are standing on a real scaffold.





Revision cards

We have divided this book into spreads. Each spread represents one chunk of the specification as indicated at the top left of each spread. For each topic you should produce a revision card.

For some spreads you might decide to have two revision cards.

The big secret is that you should do this **NOW**. Revision is meant to be re-vision – seeing it again.

When you study a topic, prepare a card like the one below. It will help you understand the spread.

But the joy is that you will have a set of revision cards all ready for the end-of-year exams.



Topic: The psychodynamic approach		Cue word
Describe	Conscious (iceberg), unconscious (drives, instincts, memories).	Unconscious
Describe	Id (primitive, pleasure), Ego (mediator, reality), Superego (morality).	Tripartite
Describe	Each stage has conflict to resolve or leads to fixations.	Psychosexual
Describe	Oral, anal, phallic latency, genital.	Sequence
Describe	Boys desire mother, hate father but later identify. Girls penis envy.	Oedipus
Describe	Unconscious strategies, e.g. repression and displacement.	Defence
Discuss	Psychological treatment (psychoanalysis), access unconscious e.g. dream analysis.	Real-world
	Modern-day 'talking therapies'.	
Discuss	However maybe only mild neuroses, not e.g. schizophrenia.	Limited
	Lose contact with reality.	
Discuss	Influence on thought, mental disorder.	Explanatory
	Importance of childhood.	
Discuss	Can't falsify (Popper), e.g. testing the Id.	Untestable
	Subjective research e.g. Little Hans.	
Optional		
Discuss	Unconscious conflicts determine behaviour e.g. slips of tongue.	Determinism
	Most of us have a sense of free will (responsibility).	

Try writing an essay just using your revision card.





A cue

There are snooker cues and there are other cues – a cue is a thing that serves as reminder of something else. An actor knows she must come in on cue – a reminder or signal.

Psychologists have investigated the value of cues in remembering. They act as a reminder of what else you know.

The revision card on the left has cue words. Cover the text in the middle column and see if the cue word can help you remember what is there.

If you can't remember anything, then look at the middle column. If you need further prompting look at the writing frame on the facing page.

Tomorrow repeat the same sequence and see if you can remember more. And so on. Eventually all you need to remember are the cue words and the rest should pop into your mind.

Psychological research shows that people often have much more in their heads than they can recall – they just need the right cue.

There are two spaces for each evaluation point in order to record the levels of elaboration.

Mnemonics

Here is a final bit of psychology – we psychologists know what techniques work! And the main answer is ... *processing*. The more you play around with and discuss the ideas, the better you will remember them. Just making the revision card will give you an opportunity to process the new ideas.

Here are two further thoughts:

Method of loci

This is a method used by stage performers who wow audiences with memory feats. Say, for example, the performer is trying to memorise the names of every member of the audience. He mentally walks around his house (or down a street) and places each name somewhere, forming a link between the name and place – for example, he puts 'Mary' in a bowl of berries (Mary Berry, the cookery expert). Later, when trying to recall names he just takes a mental walk and finds the items where he left them. Try it out – it really works for things you are finding difficult to remember.

Test your recall

Most students revise by reading things over and over (**maintenance rehearsal** in the lingo of psychologists). But this doesn't work *that* well. What works much better is to read something, then close your book, and write down everything you can remember. *The act of trying to recall the information* strengthens the **memory trace**.

Index/Glossary

Absence of gating Face-to-face (FtF) relationships often fail to form because of obstacles such as facial disfigurements that some people might find off-putting. These barriers or 'gates' are absent in the virtual world allowing relationships to begin when they might not offline. **134–135, 141, 145**

Abstract The key details of the research report. **62, 81, 87, 91**

Absorption addiction model Explains parasocial relationships as total preoccupation in a celebrity's life, plus an addictive striving for a stronger involvement. **136–137, 139, 141, 145**

Abusive relationships **131, 141, 298**

Accommodation A form of learning that takes place when we acquire new information that changes our understanding of a topic to the extent that we need to form one or more new schemas and/or radically change existing schemas in order to deal with the new understanding. **178–179, 194, 198**

Acetylcholine A neurotransmitter. In the central nervous system, acetylcholine plays a role in attention and arousal. In the peripheral nervous system, it works by causing muscles to contract. **37, 54, 222, 360, 368**

Action potential A short increase and decrease of electrical activity in the membrane of a neuron, transmitting a signal away from the cell body. **36–37, 54, 58, 272**

Adaptive Any physical or psychological characteristic that enhances an individual's survival and reproduction, and is thus likely to be naturally selected. Such characteristics are passed on to future generations. **16, 23, 41, 49, 55, 118–119, 152, 170, 212, 226–228, 234, 238, 245–246, 248–250, 252, 257, 274, 279, 296–299, 306, 313–314, 316, 318, 370, 372**

Addiction A disorder in which an individual takes a substance or engages in a behaviour that is pleasurable but eventually becomes compulsive with harmful consequences. Marked by physiological and/or psychological dependence, tolerance and withdrawal. **11, 53, 77, 136–137, 139, 141, 145, 240–241, 338, 354–378, 380–385**

Addison's disease **257, 284**

ADHD Attention deficit hyperactivity disorder, a condition characterised by inattention, impulsiveness and motor hyperactivity which is inappropriate for a child's age. May continue into adolescence and adulthood. **53, 187, 199, 328**

Adoption studies Research into nature versus nurture conducted by comparing a child's similarity to their biological parents (shared genes) and to their adoptive parents or siblings (shared environment). **101, 110, 205, 218, 294–295, 297, 314, 328, 348, 359**

Adrenal cortex The outer region of the adrenal glands. **256, 284**

Adrenal glands Small glands located on top of each kidney that are part of the endocrine system. Various hormones are produced including adrenaline and noradrenaline and corticosteroids such as cortisol. **35, 256–257**

Adrenal medulla The central region of the adrenal glands. **35, 256, 284**

Adrenaline A hormone produced by the adrenal glands which is part of the human body's immediate stress response system. Adrenaline has a strong effect on the cells of the cardiovascular system – stimulating the heart rate, contracting blood vessels and dilating air passages. **24, 34–35, 37, 54, 113, 174, 222, 233, 248, 252, 256, 258–259, 264, 266, 268, 272, 284–285, 288–289, 318**

Affectionless psychopathy A behaviour disorder in which the individual has no ability to experience shame or guilt and lacks a social conscience. This means that they may find it 'easier' to commit crimes. **336, 349**

Agonists A drug that has the same effect as a naturally produced neurotransmitter. **232, 368, 381**

Aggression **12–13, 23, 30, 66–67, 79, 100–101, 103, 110, 118, 140, 152–153, 170, 174, 202, 290–319, 329–330, 372**

- **social psychological explanations of** Any theory that argues aggression is the result of an interaction between an individual's characteristics and features of the situations in which behaviour occurs. **300–305, 315, 317–319**

Aim A general statement of what the researcher intends to investigate; the purpose of the study. **62, 70, 76, 78–80, 89, 138, 169, 312, 347**

Alpha bias Research that focuses on differences between men and women, and therefore tends to present a view that exaggerates these differences. **94–95, 112, 114, 337**

Alternative hypothesis A testable statement about the relationship (difference, association, etc.) between two or more variables. It is the alternative to the null hypothesis. **72–80, 82–83, 87, 90, 347**

Amygdala A region located in the temporal lobe of the cerebral cortex. It is part of the limbic system and is associated with memory, emotion, sleep, arousal and the fight or flight response. **59, 240, 253, 292–293, 314, 316, 318**

Anal stage **18, 31, 175**

Androcentrism Male-centred, when 'normal' behaviour is judged according to a male standard (meaning that female behaviour is often judged to be 'abnormal' or 'deficient' by comparison). **94–95, 110, 114**

Androgens A group of hormones that control the development of male characteristics. Usually present in only small quantities in women. **53, 152, 170, 278**

Androgyny Displaying a balance of masculine and feminine characteristics in one's personality. **147, 150–151, 163–164, 170–172, 174–175**

Anger management A therapeutic programme that involves identifying the signs that trigger anger as well as learning techniques to calm down and deal with the situation in a positive way. The aim of anger management is not to prevent anger but to recognise it and manage it. Anger management can be offered in prison to encourage self-awareness and facilitate rehabilitation. **75, 320, 339, 340–344, 349, 353, 372, 381, 385**

Anisogamy The differences between male and female sex cells (gametes). **118, 140, 142, 144**

Anonymity An important aspect of confidentiality; a participant remains anonymous, i.e. their name is withheld or simply not recorded. **81, 86, 108, 134, 141, 193, 304–305, 319**

Anorexia nervosa (AN) Literally a 'nervous lack of appetite'. An eating disorder in which the individual has an intense fear of becoming fat despite being seriously underweight due to gross undereating. **224, 232–239, 245, 248–249, 251–253**

ANS *See* Autonomic nervous system **24, 34–35, 54, 58, 98, 110, 256, 266, 284–285, 287–288, 292**

Antagonist A drug that prevents the effects of a naturally produced neurotransmitter. **35, 208, 219–220, 361, 368–369, 380–381, 385**

Anterior cingulate gyrus Frontal part of the cingulate cortex that resembles a 'collar' surrounding the frontal part of the corpus callosum. **39, 43, 54, 206, 292**

Antidepressant A group of drugs which increase the production of serotonin and/or noradrenaline, and reduce symptoms of depression. **17, 27, 49, 233**

Antipsychotics Drugs used to reduce the intensity of symptoms, in particular the positive symptoms, of psychotic disorders like schizophrenia. **204, 208–209, 215, 219–220, 222–223**

Antisocial personality disorder (APD) A mental health condition where a person has a repeated pattern of behaviour manipulating or violating the rights of others. Often leads to crimes against people. **328, 352, 358, 383–384**

APD *See* Antisocial personality disorder **328–329, 348, 358–359, 380, 384**

Approach A way to explain behaviour; a general perspective or mode of thinking. **6–24, 26–31, 43, 55, 64, 82–83, 86, 92, 94, 96–105, 107, 110–115, 119, 133, 136, 143, 151, 153, 157–158, 160, 162–163, 167, 170, 173–174, 178–180, 182, 186–187, 191, 200, 202, 207, 210, 212–215, 218–219, 221, 223, 231–232, 237–238, 240, 243, 245, 247, 251, 260–263, 272, 278–279, 282–283, 286–288, 296–297, 299, 305, 314, 320, 322–327, 329, 335–337, 340–341, 343, 345, 347–353, 363, 378–379, 381–382**

Artificial intelligence Machines showing human-like reasoned behaviour. **14–15, 26**

Assimilation A form of learning that takes place when we acquire new information or a more advanced understanding of an object, person or idea. When new information does not radically change our understanding of the topic we can incorporate (assimilate) it into an existing schema. **178–179, 194, 198, 322, 348**

Atavistic form A biological approach to offending that attributes criminal activity to the fact that offenders are genetic throwbacks or a primitive subspecies ill-suited to conforming to the rules of modern society. Such individuals are distinguishable by particular facial and cranial characteristics. **320, 326–327, 346–348, 350, 352–353**

Attachment theory An explanation of how an enduring emotional bond forms between two people that persists over time. Leads to certain behaviours such as clinging and proximity-seeking. **16, 56, 94, 96–97, 100–103, 105, 110–111, 114, 136–137, 141, 145, 207, 218, 221, 278**

Attachment type Refers to whether a person is securely or insecurely attached, i.e. the way you relate to others in the context of intimate relationships. **96, 100, 110, 114, 136–137**

Attention deficit hyperactivity disorder *See* ADHD **328**

Atypical antipsychotics Drugs for schizophrenia (a psychotic disorder) developed after typical antipsychotics. They typically target a range of neurotransmitters such as dopamine and serotonin. Examples include *clozapine* and *risperidone*. **208–209, 219–220, 223**

Atypical sex chromosome patterns Any sex chromosome pattern that deviates from the usual XX/XY formation and which tends to be associated with a distinct pattern of physical and psychological symptoms. **147, 154–155, 170, 174–175**

Auditory area Located in the temporal lobe and concerned with the analysis of speech-based information. **38–40, 54, 58**

Autism This is a broad term for a wide range ('spectrum') of features. Autistic people face challenges with social interaction/communication and repetitive/restricted behaviours. As a spectrum condition, autism affects people in different ways and co-occurs with learning disability in some. **41, 181, 187–191, 193–195, 197, 199**

Autonomic nervous system (ANS) Transmits information to and from internal bodily organs. It is 'autonomic' as the system operates involuntarily (i.e. it is automatic). It has two main divisions: the *sympathetic* and *parasympathetic* nervous systems. **24, 34–35, 54, 58, 98, 110, 256, 266, 284–285, 287–288, 292**

Autonomy Our experience of freedom in deciding how we should behave, and degree of independence from others. **21, 234–235, 248, 252, 264**

Aversion therapy A behavioural treatment based on classical conditioning. A maladaptive behaviour is paired with an unpleasant stimulus such as a painful electric shock. Eventually, the behaviour is associated with pain without the shock being used. **101, 110, 363, 370–371, 380–382, 385**

Avery, Zach **167**

Avolition A negative symptom of schizophrenia. It involves loss of motivation to carry out tasks and results in lowered activity levels. **202–203, 205, 218, 222**

Axon The long projection of the neuron from the cell body. **25, 36–37, 42–43, 54, 58**

Baillargeon, Renée **177, 181, 184–185, 194, 198–199**

Bandura, Albert **9, 12–13, 23, 30, 157, 164, 170–171, 175, 236, 302–303, 308–309, 315, 317, 332**

Bar chart A type of graph in which the frequency of each variable is represented by the height of the bars. **25, 62, 90, 185, 192–193, 299**

Basal ganglia **114**

Behaviour checklist In an observational study, dividing the behaviour(s) to be observed into individual components. A form of operationalisation. Each component should be an observable behaviour. **342**

Behaviour modification An application of the behaviourist approach to treatment (such as the management of offenders in penal institutions). It is based on the principles of operant conditioning. The general aim is to replace undesirable behaviours with more desirable ones through the selective use of positive and/or negative reinforcement. **212, 219, 320, 340–344, 349, 353**

Behaviour shaping Using operant conditioning to teach a complex procedure by successively rewarding behaviours that are closer and closer to the target behaviour. **101, 110**

Behavioural categories When a target behaviour is broken up into components that are observable and measurable. **25, 62, 66–67, 69, 86, 103, 129, 169, 227, 243, 297, 303, 365**

Behavioural interventions Any treatment based on behaviourist principles of learning such as classical and operant conditioning. **99, 354, 370–371, 373, 381–382, 385**

Behavioural therapy Any form of therapy derived from the behaviourist model, for example systematic desensitisation. **212, 371, 381**

Behaviourist approach A way of explaining behaviour in terms of what is observable and in terms of learning. **7–15, 22–23, 26, 28–31, 98–100, 102, 110–111, 114–115, 340, 382**

Bem Sex Role Inventory (BSRI) The first systematic attempt to measure androgyny using a rating scale of 60 traits (20 masculine, 20 feminine and 20 neutral) to produce scores across two dimensions: masculinity-femininity and androgynous-undifferentiated. **150–151, 170, 172, 174**

Benzodiazepine (BZ) A drug used to reduce anxiety, they are GABA agonists i.e. they act like a naturally produced neurotransmitter, and enhance GABA. **272, 285, 289, 292–293, 356**

Beta bias Research that focuses on similarities between men and women, and therefore tends to present a view that ignores or minimises differences. **94–95, 110, 112, 114, 269, 285**

Beta blockers A drug used to reduce anxiety by binding to beta-receptors in the cells of the heart and other parts of the body that are usually stimulated during sympathetic arousal. Therefore they prevent adrenaline and noradrenaline having such a strong effect. **272–274, 285, 289**

Biofeedback A method of stress management that turns physiological processes such as heart rate into signals that a client then learns to control. Clients do this by applying the techniques they have learned, such as relaxation and cognitive restructuring. **79, 255, 276–277, 285, 289**

Biological approach A perspective that emphasises the importance of physical processes in the body such as genetic inheritance and neural function. **7–9, 16–17, 21–24, 26–27, 30–31, 98, 104, 114–115, 163, 214, 231, 240, 326, 329, 348**

Biological determinism The belief that behaviour is caused by biological (genetic, hormonal, evolutionary) influences that we cannot control. **17, 27, 31, 98–99, 110, 113, 329, 348**

Biological preparedness The innate ability of some organisms to associate significant (i.e. in terms of survival) combinations of stimuli, responses and reinforcers. **226, 248, 252**

Biological reductionism A form of reductionism which attempts to explain behaviour at the lowest biological level (in terms of the actions of genes, hormones, etc.). **102–103, 111, 114**

Biological rhythms Distinct patterns of changes in body activity that conform to cyclical time periods. Biological rhythms are influenced by internal body clocks (endogenous pacemakers) as well as external changes to the environment (exogenous zeitgebers). **33, 46–51, 55, 59**

Biological structure An arrangement or organisation of parts to form an organ, system or living thing. **9, 14, 16–17, 22, 26, 30, 36, 98, 296, 318**

Biosocial approach Explanations of behaviour that combine biological (genetic and/or physiological) factors with social ones (the effects of other people and environments). **23, 214**

Bipolar disorder A mental disorder which includes both manic and depressive episodes. Mania is characterised by an elevated and expansive mood, rapid speech which may be hard to understand, delusions, overactivity and impulsive behaviour. **203, 218**

Blind A research procedure where neither the participant nor the experimenter knows the key details of a study e.g. the aims and hypothesis. **38, 51, 55, 69, 86, 153, 273, 321, 352, 371, 381, 385**

Bobo doll **12–13, 26, 30, 302–303, 308–309, 315, 317–318**

Bottom-up approach Profilers work up from evidence collected from the crime scene to develop hypotheses about the likely characteristics, motivations and social background of the offender. **320, 322, 324–325, 348, 351–353**

Boundary model Explains how restrained eaters are less sensitive to satiety so need more food before feeling full. When they break their self-imposed diet boundary they continue to eat to the satiety boundary, making weight gain more likely. **242–243, 249, 253**

Bowlby, John **16, 100, 110, 136, 336–337, 349, 353**

Brain fingerprinting **14**

Brain scan A technique used to investigate the functioning of the brain by taking images of the living brain. This makes it possible to match regions of the brain to behaviour by asking participants to engage in particular activities while the scan is done. Brain scans are also used to detect brain abnormalities such as tumours. Examples: CAT scan, PET scan, MRI scan, fMRI scan. **16, 39, 41, 44–45, 54, 95, 99, 191, 199, 249, 328**

Briefing Giving information prior to the beginning of study to inform participants, for example, of what is involved in the study and the rights to withdraw at any time. **24, 81, 347**

Broca's area An area of the frontal lobe in the left hemisphere (in most people), responsible for speech production. **14, 38–40, 42, 58, 204, 222**

Calculated value The value of a test statistic calculated for a particular data set. **53, 72–80, 87, 246–247, 283, 312–313, 346–347, 378**

Candidate genes Studying genetic influence by focusing on one particular gene that is thought to be of interest. **204, 205, 218, 222–223, 232–233, 248, 251, 328, 348**

Cardiovascular disorders (CVDs) Any disorder of the heart (cardio) or blood vessels (vascular) including events that affect the brain (e.g. stroke). **258–259, 284, 286**

Cartesian dualism The distinction made between the body and mind, first systematically discussed by the philosopher Descartes.

Case history A record of a person's previous experiences or behaviours. **64, 86**

Case studies An in-depth investigation, description and analysis of a single individual, group, institution or event. **9, 19, 23, 26–27, 39, 43, 51, 54–55, 61–62, 64–65, 69, 86, 90, 91, 104–105, 111, 115, 133, 160–161, 171, 173, 235, 281, 337, 359, 369**

Castration anxiety Anxiety created by the fear of losing the genitals or injury to them. Freud proposed that this is experienced by boys during the Oedipal stage of development. **94, 160, 171, 173, 175, 337**

Categorical data **71** *Also see* Nominal data

Catharsis The process of releasing pent-up psychic energy. **300–301, 311, 315, 317**

Causal conclusions **315**

Cause and effect **11, 127, 129, 141, 308, 309, 318, 383**

CBT *See* Cognitive behaviour therapy **23, 49, 55, 77, 210–211, 214–215, 219–223, 342, 349, 371–373, 377, 381, 385**

Cell body The part of a cell that contains the nucleus. **36, 54, 58**

Central executive (CE) The component of the working memory model (WMM) that co-ordinates the activities of the three subsystems in memory. It also allocates processing resources to those activities. **14**

Central nervous system (CNS) Consists of the brain and the spinal cord and is the origin of all complex commands and decisions. **34, 36–37, 54, 58, 272, 285, 289, 360**

Cerebellum A large structure at the back of the hindbrain, which has many deep folds. It is involved with motor control. **149**

Cerebral cortex The surface layer of the forebrain (the two hemispheres of the brain). It is grey in colour and it is highly folded to make it possible to fit the massive amount of material inside the skull. **34, 38, 50, 54**

Challenge Hardy people view stressful situations as opportunities for self-development rather than threats to their self-esteem. **270–271**

Chance The extent to which something occurs randomly, i.e. in the absence of a discoverable cause and with no pattern. **49, 55, 70, 72**

Chi-Squared A test for an association (difference or correlation) between two variables or conditions. Data should be nominal level using an unrelated (independent) design. **61–62, 70, 80–81, 85–87, 90–91**

Chlorpromazine **208–209, 219**

Chromosomes Found in the nucleus of living cells carrying information in the form of genes. The 23rd pair of chromosomes determines biological sex. **16, 147–148, 152–155, 170, 174–175**

Cingulate gyrus *See* Anterior cingulate gyrus **39, 54, 292**

Circadian rhythms Biological rhythms, subject to a 24-hour cycle, which regulate a number of body processes such as the sleep/wake cycle and changes in core body temperature. **33, 46–48, 50–52, 55–56, 59**

Circannual rhythm **46, 48, 55**

Class inclusion An advanced classification skill in which we recognise that classes of objects have subsets and are themselves subsets of larger classes. Pre-operational children usually struggle to place things in more than one class. **180–181, 194, 198–199**

Classical conditioning Learning by association. Occurs when two stimuli are repeatedly paired together – an unconditioned (unlearned) stimulus (UCS) and a new 'neutral' stimulus (NS). The neutral stimulus eventually produces the same response that was first produced by the unconditioned (unlearned) stimulus alone. **10–11, 26, 29–30, 228–229, 248, 353, 362–363, 368, 370, 381–382, 384–385**

Classification of mental disorder The process of organising symptoms into categories based on which symptoms frequently cluster together. **202**

Client-centred therapy A method of treatment for mental disorders where the focus is on the problem from the client's viewpoint rather than any diagnosis from the therapist. **20–21, 99** *Also see* Counselling

Closed questions Questions for which there is a fixed choice of responses determined by the question setter. For example, do you smoke? (yes/no) **62, 86, 215, 271, 283**

Clozapine **208–209, 219–220, 222**

CNS *See* Central nervous system **34, 36–37, 58, 272, 285, 289**

Co-morbidity The occurrence of two illnesses or conditions together, for example a person has both schizophrenia and a personality disorder. Where two conditions are frequently diagnosed together it calls into question the validity of classifying the two disorders separately. **202–203, 218, 220, 222**

Co-variables The variables investigated within a correlation, for example height and weight. They are not referred to as the independent and dependent variables because a correlation investigates the association between the variables, rather than trying to show a cause-and-effect relationship where one variable 'depends' on the other. **35, 52, 62–63, 78, 85–87, 323**

Coding The stage of a content analysis in which the communication to be studied is analysed by identifying each instance of the chosen categories (which may be words, sentences, phrases etc.). **62, 64, 86, 90, 95, 169, 204, 283**

Cognitive appraisal The way a person interprets or thinks about a situation. **257, 270, 274, 278, 284–285**

Cognitive approach The term 'cognitive' has come to mean 'mental processes', so this approach is focused on how our mental processes (e.g. thoughts, perceptions, attention) affect behaviour. **7–9, 11–12, 14–16, 19–23, 26, 29–31, 83, 98, 114–115, 153, 207**

Cognitive behaviour therapy (CBT) A method for treating mental disorders based on both cognitive and behavioural techniques. From the cognitive viewpoint the therapy aims to deal with thinking, such as challenging negative thoughts. The therapy also includes behavioural techniques. **209–211, 219, 274, 285, 333, 342, 349, 352, 354, 372–373, 381, 385**

Cognitive bias A distortion of attention, memory and thinking. It arises because of how we process information about the world, especially when we do it quickly. For instance, we recall memories that confirm our existing views and ignore others. This can sometimes lead to irrational judgements and poor decision-making. **311, 366–367, 372, 375, 378, 380, 381**

Cognitive development A general term describing the development of all mental processes, in particular thinking, reasoning and our understanding of the world. Cognitive development continues throughout the lifespan but psychologists have been particularly concerned with how thinking and reasoning develops through childhood. **80, 156–158, 170, 177–183, 185–186, 194, 196, 198–199**

Cognitive distortions Faulty, biased and irrational ways of thinking that mean we perceive ourselves, other people and the world inaccurately and usually negatively. **238, 249, 253, 332–333, 349–350, 352, 378**

Cognitive explanations Explanations that focus on mental processes such as thinking, language and attention. **147, 156–159, 170, 174–175, 206, 207, 218, 222, 238, 249, 332–333**

Cognitive neuroscience The scientific study of biological structures that underpin cognitive processes. **9, 14–15, 22, 26, 30, 82, 103**

Cognitive priming The way a person thinks (cognitive) is triggered by cues or 'scripts' which make us ready (primed) to respond in specific ways. For example, watching violent films provides a 'script' about how to react in certain situations so a person is more ready to respond in the same way. **291, 310–311, 315, 319**

Cognitive reserve **43, 54**

Collectivist culture A group of people who place more value on the 'collective' (i.e. the other group members) rather than each individual being most focused on themselves. Collectivist cultures also value interdependence rather than independence. The opposite is true of individualist culture. **21, 28, 97, 110, 121, 129, 133, 140–141, 143, 265, 288**

Commitment (in relationships) A romantic partner's intention or desire to continue a relationship, reflecting a belief that the relationship has a viable long-term future. **118, 121, 126–127, 130–131, 136, 141, 144–145, 149**

Commitment (in relation to hardiness) Hardy people throw themselves fully into all life has to offer them rather than standing on the sidelines. **270–271, 275–276, 285, 289**

Comparison with alternatives A judgement that partners make concerning whether a relationship with a different partner would bring more rewards and fewer costs. **126–127, 130–131, 141**

Comparison level (CL) A judgement about the costs and benefits of a current relationship based on the costs and benefits of past relationships. **126–127, 130, 141, 144**

Complementarity Similarity becomes less important as a relationship develops, and is replaced by a need for your partner to balance your traits with opposite ones of their own. **124–125, 140, 144**

Computer games A game generally played onscreen using a keyboard, mouse or other controller. Types include simulations, first-person shooters, adventures, sports, and role-playing games, often conducted using an online service. **186, 308–311, 315**

Computer models A representation of behaviour using concepts and terms related to computers. **14–15, 26**

Concordance rate A measure of similarity (usually expressed as a percentage) between two individuals or sets of individuals on a given trait. **16–17, 114, 205, 232, 240, 249, 251, 294–295, 314, 328–329, 348**

Concurrent validity The extent to which a psychological measure relates to an existing similar measure. **62, 68–69, 84, 86, 89–90**

Conditioned response (CR) In classical conditioning, the response elicited by the conditioned stimulus (CS), i.e. a new association has been learned so that the neutral stimulus (NS) produces the unconditioned response (UCR) which is now called the CR. **10, 29, 102, 111, 370, 382**

Conditioned stimulus (CS) In classical conditioning, the neutral stimulus (NS) becomes the CS after the NS has been paired with the unconditioned stimulus (UCS). The NS now takes on the properties of the UCS and produces the unconditioned response (now a conditioned response, CR). **10, 29, 102, 111, 370, 382**

Conditions of worth When a parent places limits or boundaries on their love of their children. For instance, a parent saying to a child, 'I will only love you if...you study medicine' or 'if you split up with that boy'. **20–21, 27, 31, 99**

Confederate An individual in a research study who is not a real participant and has been instructed how to behave by the researcher. **300–301, 305, 310–312, 315**

Confidentiality An ethical issue concerned with a participant's right to have personal information protected. **106, 111, 133, 169, 192, 235, 281, 313**

Conformity 'A change in a person's behaviour or opinions as a result of real or imagined pressure from a person or group of people' (Elliot Aronson 2011). **68, 90, 96–97, 103, 114, 315, 334**

Confounding variables Any variable, other than the independent variable (IV), that may have affected the dependent variable (DV) so we cannot be sure of the true source of changes to the DV. Confounding variables vary systematically with the IV. **49, 55, 209, 243, 246, 251, 259, 265, 284, 303, 309, 311–313, 315, 327, 339, 347–348**

Congruence The aim of Rogerian therapy, when the self-concept and ideal self are seen to broadly accord or match. **20–21, 27, 31, 99**

Consciousness **8, 26, 28, 52, 99, 103, 272**

Consent *See* Informed consent **25, 41, 45, 54–55, 57, 65, 106–107, 138–139, 167, 169, 192, 282–283, 312–313**

Conservation The ability to realise that quantity remains the same even when the appearance of an object or group of objects changes. For example, the volume of liquid stays the same when poured between vessels of different shapes. **157, 180–181, 194, 196, 198–199, 256**

Constructivism The view that humans generate knowledge from an interaction between their experiences and their ideas.

Content analysis A research technique that enables the indirect study of behaviour by examining communications that people produce, for example, in texts, emails, TV, film and other media. **61–62, 64–66, 86, 90–91, 94–95, 121, 168–169, 245, 265, 282–283, 309, 359, 366, 378–380**

Contingency table A matrix of rows and columns that displays the frequency distribution of variables. **80, 85, 91, 139, 283, 312**

Control (in relation to anorexia) The experience of being in charge of one's own self and behaviour. People with AN are thought to struggle against family dependence for control, as they also do for autonomy. **232, 234–238, 245, 248–249, 251–253**

Control (in relation to hardiness) Hardy people believe that stressful situations can be overcome through their own efforts. **270–271, 281, 285, 289**

Control (in relation to workplace stress) The degree of freedom a worker has to perform their job how they wish. Often defined in terms of the autonomy they have to make decisions. **258, 264–265, 284, 288–289**

Control (in relation to research methods) The extent to which any variable is held constant or regulated by the researcher, often in order to reduce the influence of extraneous and confounding variables. **8–12, 15, 25–27, 29**

Control condition The condition in a repeated measures design that provides a baseline measure of behaviour without the independent variable (IV) **75, 188–189, 209, 217, 312, 373**

Control group In an experiment with an independent groups design, a group of participants who receive no treatment. Their behaviour acts as a baseline against which the effect of the independent variable (IV) may be measured. **12, 41–43, 51, 57, 69, 86, 188, 207, 215, 221, 223, 228–229, 238, 245, 258, 268–269, 273, 277, 281, 300, 306–307, 327, 331–332, 340, 342–343, 352, 373, 381**

Controlled observation Watching and recording behaviour within a structured environment, i.e. one where some variables are managed. **62, 103**

Coronary heart disease The arteries that supply blood to the heart become narrowed by a build up of fatty material. This may eventually lead to a blockage and a heart attack. **256, 264, 268**

Corpus callosum **40–41, 57, 59**

Correlation A mathematical technique in which a researcher investigates an association between two variables, called co-variables. **35, 42, 47, 52–53, 55, 61–63, 66–67, 69–70, 72–73, 78–79, 82, 84–87, 90–91, 100, 121, 123, 128, 131, 137–138, 140–141, 145, 165, 187, 195, 204, 205, 239, 243, 260–264, 269, 271, 282, 284, 286, 288, 292, 305, 308–309, 315, 318–319, 323, 346, 359, 361, 375, 377, 379–380, 383**

Correlation coefficient A number between −1 and +1 that represents the direction and strength of a relationship between co-variables. **62–63, 66–67, 69, 84, 86, 90, 100, 205, 377**

Correlational hypothesis A hypothesis for an investigation using a correlational analysis. **82**

Cortex The outer part of an organ. The cerebral cortex is the surface layer of the forebrain. It is grey in colour and it is highly folded to make it possible to fit the massive amount of material inside the skull. **14, 34, 38–40, 42–43, 50, 54, 106, 190, 191, 195, 204–205, 209, 218, 222, 256, 284, 292–293, 314, 328–329, 348, 352, 360, 368, 380–381, 384**

Cortical remapping *Also see* Plasticity

Cortical specialisation **38** *Also see* Localisation of function

Cortisol An important hormone produced by the adrenal cortex. It helps the body to cope with stressors by controlling how the body uses energy. Cortisol suppresses immune system activity. **152, 170, 222, 256–258, 266–267, 276–278, 284–285, 288–289, 293, 314, 318**

Counselling A form of therapy that aims to increase a client's self-esteem through unconditional positive regard from the therapist. This is based on the concept that maladjusted behaviour or unhappiness occurs as a result of receiving conditional love in childhood and, as a result, continuing to strive for acceptance. Such striving blocks the ability to self-actualise. **19–21, 23, 27, 101, 110, 133, 204, 205, 215, 218–219, 221–223, 368, 371, 381**

Counterbalancing An attempt to control for the effects of order in a repeated measures design: half the participants experience the conditions in one order, and the other half in the opposite order. **62, 135, 158, 217, 267, 305, 367**

Counterconditioning Being taught a new association that is the opposite of the original association, thus removing the original association. **363, 370, 381–382, 384**

Covert observation Participants' behaviour is watched and recorded without their knowledge or consent. **25, 69, 86**

Covert sensitisation A form of aversion therapy based on classical conditioning. A client imagines an unpleasant stimulus and associates this with a maladapive behaviour (in contrast with aversion therapy where the unpleasant stimulus is actually experienced). **370–371, 373, 381, 385**

Criminal personality A feature of Eysenck's theory of crime, an individual who scores highly on measures of extraversion, neuroticism and psychoticism and cannot easily be conditioned, is cold and unfeeling, and is likely to engage in offending behaviour. **330–331, 346, 348**

Criterion validity A means of assessing validity by considering the extent to which people who do well on a test do well on other things that you would expect to be associated with the test. **203, 218, 220**

Critical value When testing a hypothesis, the numerical boundary or cut-off point between acceptance and rejection of the null hypothesis. **62, 72–81, 85, 87, 90, 347**

Cross-cultural research A kind of natural experiment in which the independent variable (IV) is different cultural practices and the dependent variable (DV) is a behaviour such as attachment. **97, 164–165**

Cross-sectional design One group of participants representing one section of society (e.g. young people or working-class people) is compared with participants from another group (e.g. old people or middle-class people). **187**

Cue reactivity Cravings and arousal can be triggered in, for instance, nicotine addicts when they encounter cues related to the pleasurable effects of smoking. Examples of such cues include the social situations in which they have smoked previously. **362–365, 382, 384**

Cultural bias A tendency to interpret all phenomena through the 'lens' of one's own culture, ignoring the effects that cultural differences might have on behaviour. **21, 27, 92, 96–97, 110, 114–115**

Cultural influences 'Culture' refers to the norms and values that exist within any group of people. **119, 137, 140, 187, 228–229, 231, 248, 250, 252**

Cultural relativism The idea that norms and values, as well as ethics and moral standards, can only be meaningful and understood within specific social and cultural contexts. **96, 110, 114, 171**

Culture The ideas, customs and social behaviour of a particular group of people or society. **21, 28, 92–97, 110, 121–123, 126, 129, 131, 133, 137, 140–143, 145–147, 149–151, 153, 157, 159, 162, 164–167, 170–171, 175, 182, 185, 189–190, 194, 198, 202–203, 218, 227–229, 237, 248, 250–252, 258, 264–265, 284, 288, 297, 299, 306–307, 312, 314, 317, 319, 331, 383**

Custodial sentencing A decision made by a court that punishment for a crime should involve time being in 'custody' – prison (incarceration) or in some other closed therapeutic and/or educational institution, such as a psychiatric hospital. **320, 338–339, 344–345, 348, 353**

Daily hassles The relatively minor but frequent aggravations and annoyances of everyday life that combine to cause us stress, such as forgetting where you have put things and niggling squabbles with other people. **214, 255, 261–263, 266, 282, 284, 286–289**

De-individuation A psychological state in which an individual loses their personal identity and takes on the identity of the social group when, for example, in a crowd or wearing a uniform. The result may be decreased concern about the evaluation of others. **134, 141, 145, 291, 304–305, 315, 319**

Debrief A post-research interview designed to inform the participants of the true nature of the study and to restore them to the state they were in at the start of the study. **24–25, 52, 81, 89, 192, 312, 347, 378–379**

Decentre The ability to focus on more than one aspect of a problem. **80, 157, 181, 194**

Deception An ethical issue, most usually where a participant is not told the true aims of a study (e.g. what participation will involve) and thus cannot give truly informed consent. Occasionally deception may involve the provision of false information. **106, 312, 322**

Deduction **82**

Defence mechanisms Unconscious strategies that the Ego uses to manage the conflict between the Id and the Superego. **18, 23, 27**

Degrees of freedom (*df*) The number of values in the final calculation of a statistic that are free to vary. **73, 77, 80, 90**

Delayed sleep-phase disorder (DSPD) **51**

Delusions A positive symptom of schizophrenia. They involve beliefs that have no basis in reality, for example, a person believes that they are someone else or that they are the victim of a conspiracy. **202–203, 206, 208–211, 216, 218–219, 222**

Demand characteristics Any cue from the researcher or from the research situation that may be interpreted by participants as revealing the purpose of the investigation. This may lead to a participant changing their behaviour within the research situation. **9, 13, 25–62, 68–69, 135, 209, 243, 249, 259, 263, 303, 305, 312, 315, 318, 346, 363, 384**

Dendrite Branching projections from the end of a neuron carry nerve impulses from neighbouring neurons towards the cell body. **36–37, 54, 58**

Denial A form of Ego defence where the Ego is protected by refusing to acknowledge painful realities, thoughts, or feelings. **18, 27, 31, 333, 376**

Dependence **21, 47, 97, 126, 153, 234, 248, 256, 357, 359–360, 362, 368–369, 380, 384–385** *Also see* Physical and Psychological dependence.

Dependent variable (DV) The variable that is measured by the researcher. Any effect on the DV should be caused by the change in the IV. **17, 21, 24–25, 52, 68–69, 109, 135, 139, 151, 168, 170, 192–193, 216–217, 241, 246–247, 275, 283, 293, 301, 303, 309, 313, 315, 331, 347, 361, 363, 378**

Depression A mental disorder characterised by low mood and low energy levels. **15, 17, 23, 26, 37, 48, 53, 55, 99, 103–104, 106, 110–113, 128, 203, 208, 210, 218, 221, 233, 235, 238, 240–241, 244, 249, 256, 258, 262–263, 268, 270, 273, 284–285, 330, 338, 348, 353, 362, 369**

Deprivation The state of having lost or been dispossessed of something. **13, 47, 231, 306–307, 315, 319, 336–337, 349, 353**

Deprivation model **306–307, 315, 319**

Descartes, René **100**

Descriptive statistics The use of graphs, tables and summary statistics (measures of central tendency and dispersion) to identify trends and analyse sets of data. **62–63, 70, 81, 137, 313**

Desensitisation Reduced sensitivity to a stimulus. This may be psychological (e.g. less emotional response) or physiological (e.g. lowered heart rate). This reduced response may make a behaviour such as aggression more likely. **23, 291, 310–311, 315, 319, 360, 380, 384**

Determinism The view that an individual's behaviour is shaped or controlled by internal or external forces rather than an individual's will to do something. **11, 13, 15, 17, 19, 22–23, 26–28, 31, 92, 98–99, 108, 110, 113–115, 143, 299, 307, 314, 329, 348, 361, 380**

Diagnostic Manual of Mental Disorders *See* DSM-5

Diathesis–stress model An interactionist approach to explaining behaviour. For example schizophrenia is explained as the result of both an underlying vulnerability (diathesis) and a trigger (stressor), both of which are necessary for the onset of schizophrenia. In early versions of the model, vulnerability was genetic and triggers were psychological. Nowadays both genes and trauma are seen as diatheses, and stress can be psychological or biological in nature. **23, 100, 110, 114, 206, 214–215, 219, 221, 251, 328–329, 348, 383**

Dichotic listening A technique where participants are presented with two stimuli simultaneously and asked to attend to (shadow) only one of them. **168**

Dieting A conscious attempt to lose weight, usually by restricting how much is eaten. A number of biological and psychological factors (e.g. genetic, neural, cognitive) potentially influence the success or failure of dieting attempts. **224, 231–232, 236, 242–245, 247–249, 253**

Differential association theory An explanation for offending which proposes that, through interaction with others, individuals learn the values, attitudes, techniques and motives for offending behaviour. **320, 334–335, 349, 352–353**

Differential reinforcement Rewarding some behaviours in preference to others. A form of selective reinforcement. **162–163, 171, 175**

Direct reinforcement A human/animal receives the reward themselves, in contrast with indirect reinforcement where another human/animal is seen to be rewarded. **12, 162, 171, 175, 236, 248–249, 302**

Directional hypothesis States the direction of the difference or relationship e.g. more or less, positive or negative. **24, 73, 77, 85, 88, 125, 127, 158, 227, 259, 273, 279, 301, 305, 328, 377**

Discrete data Data that can only take certain values, for example the number of children in a class – you can't have half a child. **71**

Discussion A consideration of what the results of a research study tell us in terms of psychological theory. **21–22, 57, 62, 64–65, 81, 85, 87, 91, 98, 106, 113, 123, 135, 143, 197, 221, 234–235, 248, 274–275, 277, 281, 286, 317, 330, 339, 351, 369**

Disinhibition A lack of restraint (no longer being inhibited). May be due to environmental triggers or overexposure to a stimulus, resulting in socially unacceptable behaviours becoming acceptable and therefore more likely. **134, 141, 242–244, 249, 291, 310–311, 315, 319**

Disorganised offender An offender who shows little evidence of planning, leaves clues and tends to be socially and sexually incompetent with lower-than-average intelligence. **322, 348, 352**

Displaced A form of Ego defense where the individual unconsciously redirects the threatening emotion from the person or thing that has caused it onto a third party. For example, you might kick the door after having a row with your boyfriend. **19, 171, 237, 300–301, 315, 317**

Dispositional explanations Any explanation of behaviour that highlights the importance of the individual's personality (i.e. their disposition). Such explanations are often contrasted with situational explanations. **306**

Dizygotic (DZ) twins Non-identical twins formed from two fertilised eggs (or zygotes). **17, 294**

Dopamine A neurotransmitter that generally has an excitatory effect and is linked to the sensation of pleasure. Unusually high levels are associated with schizophrenia and unusually low levels are associated with Parkinson's disease. **16, 204–205, 208–209, 214, 218–222, 231–233, 240–241, 248–249, 251–253, 328, 356, 358, 360–362, 368, 380–384**

Double-blind procedure Neither the participant nor researcher conducting the study are aware of the research aims or other important details of a study, and thus have no expectations that might alter a participant's behaviour. **86, 273, 352**

Down syndrome 188–189

Drug therapy Treatment involving drugs, i.e. chemicals that have a particular effect on the functioning of the brain or some other body system. In the case of psychological disorders such drugs usually affect neurotransmitter levels. **23, 104, 208, 219–221, 255, 272–273, 285, 289, 354, 368–369, 381, 385**

DSM-5 The Diagnostic and Statistical Manual of Mental Disorders is a classification system of mental disorders published by the American Psychiatric Association. It contains typical symptoms of each disorder and guidelines for clinicians to make a diagnosis. The most recent version is DSM-5. **48, 166, 202–203, 218, 238, 356, 364, 368**

Dual-centre model of eating **230, 248**

Duck, Steve **117, 121, 126, 132–133, 140–141, 143, 145, 178**

DV *See* Dependent variable. **69, 88, 139, 150, 168, 231, 327**

Dysfunctional thought processing Information processing that does not represent reality accurately and produces undesirable consequences. **206–207, 222**

DZ twins *See* Dizygotic twins **17, 27, 166, 232–233, 240, 248, 251, 294–295, 329**

Eclectic approach **22–23**

Ecological validity The extent to which findings from a research study can be generalised to other settings and siutations. A form of external validity. **62, 68–69, 83, 86, 89, 145, 317, 383**

EEG *See* Electroencephalogram **8, 17, 27, 44–45, 48, 55, 58, 199, 276, 285, 331**

Ego The 'reality check' that balances the conflicting demands of the Id and the Superego. **18–19, 21, 27, 114, 174, 336**

Egocentrism The child's tendency to only be able to see the world from their own point of view. This applies to both physical objects – demonstrated in the three mountains task – and arguments in which a child can only appreciate their own perspective. **114, 157, 180–181, 186, 194, 198–199**

Electra complex A term proposed by the neo-Freudian Carl Jung which refers to a process similar to the Oedipus complex. In girls, an attraction to and envy of their father is resolved through identification with their mother. **18–19, 160, 171, 173, 175, 336**

Electroencephalogram (EEG) A record of the tiny electrical impulses produced by the brain's activity. By measuring characteristic wave patterns, the EEG can help diagnose certain conditions of the brain. **44–45, 276**

Electromyogram (EMG) Measures the electrical activity of muscles at rest and during contraction. **276**

Emic **96–97, 110, 114**

Emotional support Giving someone a 'shoulder to cry on' to help them feel better. **126, 280–281, 285**

Empirical method Scientific approaches that are based on the gathering of evidence through direct observation and experience. **62, 82–83, 87**

Empiricism A method of gaining knowledge which relies on direct observation or testing. **83, 91, 110**

Endocrine system One of the body's major information systems that instructs glands to release hormones directly into the bloodstream. These hormones are carried towards target organs in the body. Communicates via chemicals. **33–35, 54, 58–59, 230**

Endogenous pacemakers Internal body clocks that regulate many of our biological rhythms, such as the influence of the suprachiasmatic nucleus (SCN) on the sleep/wake cycle. **33, 46, 50–51, 55, 59**

Enmeshment Members of an anorexic family are over-involved and overprotective. Their self-identities are bound up with each other. Roles are poorly defined and there is little privacy. **234–235, 248, 252**

Environment Any influence on human behaviour that is non-genetic. This may range from prenatal influences in the womb through to cultural and historical influences at a societal level. It includes biological influences, e.g. the food you eat may affect your mental development and physical growth. **9–14, 16–17, 22–23, 25–31, 34, 43, 46, 50–51, 55, 93, 98–103, 109–111, 113–114, 148, 153–155, 158–159, 162–164, 169, 179, 182, 194, 202, 204–206, 218, 226–227, 233, 237, 240–243, 245, 248–249, 251, 256, 260, 265–266, 270, 274, 278, 289, 292, 294–297, 300, 306–307, 311, 314, 316, 318, 328–329, 331, 335, 339, 341–342, 348, 352, 358, 361–362, 364**

Environmental determinism The belief that behaviour is caused by features of the environment (such as systems of reward and punishment) that we cannot control. **11, 26, 31, 98, 110, 113**

Environmental reductionism The attempt to explain all behaviour in terms of stimulus–response links that have been learned through experience. **102–103, 114**

Epilepsy **40–41, 44–45, 54–55, 57, 105**

Episodic memory A long-term memory store for personal events. It includes memories of when the events occurred and of the people, objects, places and behaviours involved. Memories from this store have to be retrieved consciously and with effort. **14, 39, 54**

Equilibration Takes place when we have encountered new information and built it into our understanding of a topic, either by assimilating it into an existing schema or accommodating it by forming a new one. Once assimilation or accommodation has taken place, everything is again balanced and we have escaped the unpleasant experience of a lack of balance – disequilibrium. **178–179, 194, 198**

Equity theory An economic theory of how relationships develop. As such, it acknowledges the impact of rewards and costs on relationship satisfaction, but criticises social exchange theory for ignoring the central role of equity – the perception that partners have about whether distribution of rewards and costs in the relationship is fair. **117, 127–129, 141–142, 144–145**

Esteem support Helping someone to attach greater value to themselves so they view their abilities with greater confidence. **280–281, 289**

Ethical committee A group of people within a research institution that must approve a study before it begins. Members may be drawn from the wider community. **107**

Ethical guidelines A set of principles designed to help professionals behave honestly and with integrity. **106, 246**

Ethical implications The consequences of any research (studies and/or theory) in terms of the effects on individual participants or on the way in which certain groups of people are subsequently regarded. There may also be consequences on a wider societal level. **92–93, 106–107, 111, 115, 283**

Ethical issues These arise when a conflict exists between the rights of participants in research studies and the goals of research to produce authentic, valid and worthwhile data. **11, 24, 26, 45, 52, 62, 64–65, 84, 86, 89, 106, 108, 135, 138, 168–169, 192–193, 212–213, 216–217, 219, 223, 243, 246, 282, 307, 312, 341, 346–347, 349, 370–371, 378, 381–382**

Ethnocentrism Judging other cultures by the standards and values of one's own culture. In its extreme form it is the belief in the superiority of one's own culture which may lead to prejudice and discrimination towards other cultures. **96–97, 110, 114, 165, 171**

Ethological explanation An explanation that seeks to understand the innate behaviour of animals (including humans) by studying them in their natural environments. **291, 296–297, 314, 316, 318–319**

Eugenic A movement which advocated that the human gene pool could be improved by encouraging reproduction in people with desirable traits and preventing reproduction in those with undesirable traits. **97, 101, 110, 327, 335, 348**

Event sampling A target behaviour or event is first established then the researcher records this event every time it occurs. **25, 62, 65, 129, 297, 365**

Event-related potentials (ERPs) The brain's electrophysiological response to a specific sensory, cognitive, or motor event can be isolated through statistical analysis of EEG data. **44–45, 55, 58**

Evolution The changes in inherited characteristics in a biological population over successive generations. **16–17, 27, 82, 118, 190, 195, 297**

Evolutionary explanation An account of the changes in species over millions of years based on the idea of natural selection – any behaviour that enhances survival and ultimately successful reproduction is perpetuated. **117–119, 123, 140, 144–145, 226–227, 248, 291, 298–299, 314, 318–319**

Excitation When a neurotransmitter, such as adrenaline, increases the positive charge of the postsynaptic neuron. This *increases* the likelihood that the postsynaptic neuron will pass on the electrical impulse. **36–37, 54, 222**

Exogenous zeitgebers External cues that may affect or *entrain* our biological rhythms, such as the influence of light on the sleep/wake cycle. **33, 46, 50–51, 55, 59**

Experiment Involves the manipulation of an independent variable (IV) to measure the effect on the dependent variable (DV). Experiments may be laboratory, field, natural or quasi. **8, 10–11, 13–14, 17, 21–26, 30, 35, 41, 45, 51–52, 62, 64–70, 78–79, 82–83, 85–86, 90–91, 95, 97–98, 103, 108, 110–112, 123, 126–127, 135, 137–139, 141, 150, 154, 163, 165, 168, 179–181, 183–184, 188–189, 192–193, 196, 209, 216–217, 229, 231, 237, 239, 241, 243, 246, 249, 259, 261, 264–265, 273–274, 282–284, 293, 300–301, 305, 307–309, 311–313, 315, 319, 325, 327, 331, 339, 341–342, 347, 363, 367, 378–379**

Experimental condition The condition in an experiment containing the independent variable as distinct from the control condition. **188, 217, 229**

Experimental design The different ways in which the testing of participants can be organised in relation to the experimental conditions. **17, 51, 62, 70, 85–86, 90, 123, 127, 154, 231, 241, 273, 293, 305, 325, 327, 341, 367**

Experimental hypothesis The hypothesis in an experiment. **82**

Experimental philosophy A field of psychology that uses empirical data as distinct from rational argument. **8**

Expressed emotion A measure of the family environment related to the extent that family members express critical, hostile and emotionally over-involved attitudes toward a family member with a disorder. **206, 210–211, 218–220, 222**

External validity The degree to which a research finding can be generalised to, for example, other settings (ecological validity), other groups of people (population validity) and over time (temporal validity). **15, 26, 68, 86, 135, 265, 284, 305, 309, 367**

Extinction In conditioning theory, the disappearance of a learned response when stimuli stop being paired (classical conditioning) or no reinforcement occurs (operant conditioning). **11, 364, 380, 384**

Extraneous variable (EV) Any variable, other than the independent variable (IV), that may have an effect on the dependent variable (DV) if it is not controlled. EVs are essentially nuisance variables that do not vary systematically with the IV. **9, 11, 24, 26, 29, 49, 55, 123, 138, 163, 193**

Extraversion A personality trait where the individual is outgoing and impulsive. **330–331, 346, 348, 352, 384**

Eyes Task A test of how well you can read emotions of others just by looking at their eyes. A test of social intelligence. **188–189, 193, 195, 197, 199**

Eyewitness testimony (EWT) The ability of people to remember the details of events, such as accidents and crimes, which they themselves have observed. Accuracy of EWT can be affected by factors such as misleading information, leading questions and anxiety. **15, 26**

Face validity A basic form of validity in which a measure is scrutinised to determine whether it appears to measure what it is supposed to measure – for instance, does a test of anxiety look like it measures anxiety? **62, 68–69, 86, 89–90, 377**

False belief tasks A method of testing whether a person can hold false beliefs i.e. the ability to recognise that someone else can hold beliefs/thoughts different from one's own. **188–189, 195, 197, 199**

Falsifiability The principle that a theory cannot be considered scientific unless it admits the possibility of being proved untrue (false). **62, 82–83, 87, 91**

Falsification Proving the truth of a research hypothesis by demonstrating that the null version is false. Scientific theories cannot be proved to be true – they can only be subjected to attempts to prove them false. **19, 83, 91**

Family dysfunction Refers to processes within a family such as poor family communication, cold parenting and high levels of expressed emotion. These may be risk factors for both the development and maintenance of schizophrenia. **206–207, 218, 222, 235**

Family influences The effects that other members of our families have on our thoughts, feelings and behaviours over the course of our development. **228, 235, 252, 256, 258–259, 379–380, 383**

Family influences (in relation to addiction) How much the at-risk individual believes his or her parents approve of addictive substances or behaviours is an influential risk factor, along with others involving family relationships. **358**

Family studies Research where close relatives (parents and their children) are compared on certain traits such as IQ or mental disorder in order to determine whether genetic factors underlie these traits. **204–205, 218, 240**

Family systems theory A psychodynamic explanation that views dysfunctional family interaction as a major factor in the development and maintenance of anorexia nervosa (AN). **224, 234–235, 248, 252–253**

Family therapy A psychological therapy carried out with all or some members of a family with the aim of improving the communications within the family and reducing the stress of living as a family. **23, 210–211, 213, 219–220, 222–223**

Field experiment An experiment that takes place in a natural setting within which the researcher manipulates the independent variable (IV) and records the effect on the dependent variable (DV). **259**

Fight or flight response The way an animal responds when stressed. The body becomes physiologically aroused in readiness to fight an aggressor or, in some cases, flee. **34–35, 94, 110, 114, 227, 248, 256–257, 266, 272, 284, 288**

File drawer problem Bias created because the results of some studies are not published (filed away), for example studies with negative results. **213, 219**

Filter theory An explanation of relationship formation. It states that a series of different factors progressively limits the range of available romantic partners to a much smaller pool of possibilities. The filters include social demography, similarity in attitudes and complementarity. **117, 124–125, 140, 144–145**

Fixation In psychoanalytic theory, a focus on a particular stage of psychosexual development because of over- or under-gratification during that stage. **18**

Fixed action pattern (FAP) A sequence of stereotyped pre-programmed behaviours triggered by an innate releasing mechanism. **296, 312, 316, 318**

fMRI *See* Functional magnetic resonance imaging **26–27, 30, 39, 43–45, 55, 58, 106, 195, 292**

Food preferences A desire for particular foods created because ancestral animals preferred to eat foods that were high in energy and low in toxins in order to increase their survival and reproductive chances. **224, 226–229, 246, 248, 250, 252–253**

Forensic psychology **75, 320–322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352**

Free will The notion that humans can make choices and their behaviour/thoughts are not determined by biological or external forces. **8, 11, 13, 15, 19–20, 23, 26–29, 92, 98–99, 108, 110, 113–115, 299, 307, 314, 317, 383**

Freud, Sigmund **8, 18–23, 31, 94, 98, 110–111, 113–114, 160–161, 163, 171, 173, 175, 336–337**

Frontal lobes The area of the brain responsible for logical thinking and making decisions. **102**

Frustration–aggression hypothesis A social psychological theory that argues that anger, hostility and even violence are always the outcome when we are prevented from achieving our goals (i.e. frustration). **291, 300–301, 315, 317, 319**

Functional magnetic resonance imaging (fMRI) A method used to measure brain activity while a person is performing a task. fMRI detects radio waves from changing magnetic fields. This enables researchers to detect which regions of the brain are rich in oxygen and thus are active. **44–45**

Functional recovery A form of plasticity. Following damage through trauma, the brain's ability to redistribute or transfer functions usually performed by a damaged area(s) to other, undamaged area(s). **33, 42–43, 54, 58–59**

GABA Gamma-aminobutyric acid, a neurotransmitter that inhibits the activity of neurons in most areas of the brain. **233, 248, 251–252, 272, 285, 289, 361, 368, 380–382**

Gage, Phineas **38–39, 54**

Gambler's fallacy **366, 380, 384**

Gambling **11, 77, 354–355, 357, 364–376, 378, 380–382, 384–385**

Gaming *See* Computer games **11, 277, 300**

Gender The psychological, social and cultural differences between boys/men and girls/women including attitudes, behaviours and social roles. **13, 19, 23, 25, 27, 65, 75–76, 91–97, 107–108, 110, 114–115, 129, 134, 137, 141, 146–175, 193, 202–203, 218, 251, 255, 257, 261, 269, 278–279, 281, 283, 285, 289, 299, 306, 312–314, 317, 337, 349, 375**

Gender bias When considering human behaviour, bias is a tendency to treat one individual or group in a different way from others. In the context of gender bias, psychological research or theory may offer a view that does not justifiably represent the experience and behaviour of men or women (usually women). **92, 94–95, 110, 114–115, 202–203, 218, 257, 269, 337, 349**

Gender constancy Usually reached by age 6 or 7 years. A child realises that gender remains the same over time and situations. They begin to identify with people of their own gender and start to behave in gender-appropriate ways. **156–159, 161, 163, 170, 172, 174**

Gender differences The ways in which men and women differ behaviourally and psychologically, and which may be due to biological differences and/or due to socially defined expectations of men's and women's behaviour. **25, 94–95, 129, 162–163, 193, 255, 278–279, 281, 285, 289, 299, 312, 314, 337**

Gender dysphoria Used to describe when a person experiences discomfort or distress because there is a mismatch between their sex assigned at birth and their gender identity. This is also the clinical diagnosis for someone who doesn't feel comfortable with the sex they were assigned at birth (www.stonewall.org.uk). **107, 148, 166–167, 170–171, 174–175**

Gender identity A child recognises that they are a boy or a girl and possesses the ability to label others as such. In Kohlberg's theory, gender identity is acquired around age 2 years. **19, 27, 146, 148, 151–153, 156–163, 166–167, 170–175**

Gender roles A set of behaviours and attitudes that are considered typical of one gender and atypical of the other. **147, 153, 156, 164–165, 171, 175**

Gender schema An organised set of beliefs and expectations related to gender that are derived from experience. Such schema guide a person's understanding of their own gender and gender-appropriate behaviour in general. **147, 157–159, 163, 170, 174–175**

Gender stability Happens around age 4 years. A child understands that their own gender is fixed and they will be a man or a woman when they are older. **156–157, 170, 172, 174**

Gender stereotypes A social perception of an individual in terms of their gender, rather than their personal attributes. **95, 157, 159, 161, 164–165, 169–171**

General adaptation syndrome Selye's explanation of how the body responds in the same way to any stressor. The response goes through three stages: alarm reaction, resistance and exhaustion. **256–257, 288**

Generalisation The extent to which findings and conclusions from a particular investigation can be broadly applied to the population. This is made possible if the sample of participants is representative of the population. It also depends on good internal and external validity. **39, 41, 47, 54–55, 62, 65, 86, 90, 104–105, 111, 165**

Genes They make up chromosomes and consist of DNA which codes the physical features of an organism (such as eye colour, height) and psychological features (such as mental disorder, intelligence). Genes are transmitted from parents to offspring, i.e. inherited. **8, 15–17, 26–28, 30, 98, 100–102, 110–111, 113–114, 118, 140, 144, 152, 175, 204–205, 214–215, 218, 221–223, 232–233, 236, 239–241, 248–251, 253, 294–295, 298, 313–314, 326, 328–329, 335, 348, 350, 356–357, 380, 383**

Genetics/Genetic explanation Genes consist of DNA strands. DNA produces 'instructions' for general physical features of an organism (such as eye colour, height) and also specific physical features (such as neurotransmitter levels and size of brain structures). These may impact on psychological features (such as intelligence and mental disorder). Genes are transmitted from parents to offspring, i.e. inherited. **101, 113, 205, 221, 232–233, 241, 251, 295, 297, 318, 327–328**

Genetic determinism A form of determinism where behaviour is assumed to be solely caused by genes. **23, 113**

Genetic vulnerability Any inherited predisposition that increases the risk of a disorder or condition. **100, 203–204, 214–215, 218–219, 221, 356–359, 380, 384**

Genital stage In psychoanalytic theory, the final stage of psychosexual development when the organ-focus is again on the genitals (as it was in the phallic stage) but this time in relation to the onset of puberty and adult sexual relations. **22, 160**

Genome Your genotype, i.e. the whole of a person's set of genes. **204, 232, 240–241, 248**

Genotype The particular set of genes that a person possesses. **16–17, 22, 27–28, 30, 154, 328**

Geographical profiling A form of the bottom-up approach to profiling based on the principle of spatial consistency – that an offender's operational base and possible future offences are revealed by the geographical location of their previous crimes. **324–325, 348**

Gestalt **102**

Ghrelin A hormone produced by cells in the stomach wall which acts as a powerful appetite stimulant, contributing to the 'on switch' of eating behaviour. **230–231, 244, 248–249, 252**

Gland An organ in the body that synthesises substances such as hormones. **34–36, 48, 50–51, 54–55, 58–59, 256–257**

Glutamate The principal excitatory neurotransmitter in the brain, involved in most aspects of normal brain function including cognition, memory and learning. **205, 208, 218–220**

Gynotikolobomassophobia **64**

Hallucinations A positive symptom of schizophrenia. They are sensory experiences that have either no basis in reality or are distorted perceptions of things that are there. **202–204, 206, 208–211, 216, 218–219, 222**

Halo effect **122–123, 140, 144**

Hard determinism The view that all behaviour is caused by something (internal or external factors), so free will is an illusion. **15, 23, 98–99, 110, 114**

Hardiness A personality factor used to explain why some people seem able to thrive in stressful circumstances whereas others don't. It consists of three elements, nicknamed the Three Cs. **255, 270–271, 281, 285, 289**

Harm *See* Psychological harm **106, 169, 209, 305, 312, 316, 332, 344–345, 371, 378**

Hassles and uplifts scale (HSUP) A self-report measure of the stress associated with everyday irritations (hassles) and of the small pleasures of daily life that are thought to partly offset the negative effects of hassles (uplifts). **262–263, 266, 284, 287**

Hemisphere The forebrain (largest part of the brain) is divided into two halves or hemispheres. **34, 38–41, 50, 54, 57–58, 95**

Hemispheric lateralisation The idea that the two halves (hemispheres) of the brain are *functionally different* and that certain mental processes and behaviours are mainly controlled by one hemisphere rather than the other, as in the example of language (which is localised as well as lateralised). **33, 40–41, 54, 57–59, 104**

Heredity The genetic transmission of mental and physical characteristics from one generation to another. **100–101, 110, 114**

Heritability The ratio between (a) genetic variability of the particular trait and (b) total variability in the whole population. **100–101, 110, 240, 249, 294**

Heterosexual bias **106, 111, 115**

Hierarchy of needs A five-levelled hierarchical sequence in which basic needs (such as hunger) must be satisfied before higher psychological needs (such as esteem and self-actualisation) can be achieved. **20–21, 27**

Hippocampus A structure in the subcortical area of each hemisphere of the forebrain, associated with memory. It is part of the limbic system, and is therefore also involved in motivation, emotion and learning. **42–43, 54, 58–59, 106, 240, 292, 314, 318**

Holism An argument or theory which proposes that it only makes sense to study an indivisible system rather than its constituent parts (which is the reductionist approach). **21–22, 27, 58, 92, 99, 102–103, 111–112, 114–115**

Homeostasis The process of maintaining a reasonably constant environment or steady state. **58, 230**

Homogeneity of variance The spread of two or more sets of data is similar. **71, 76–77, 85–87, 90**

Hormone A biochemical substance that circulates in the blood but only affects target organs. They are produced in large quantities but disappear quickly. Their effects are very powerful. **34–35, 37, 47–50, 54, 59, 94, 100, 102, 113, 147–148, 152–153, 155, 167, 170–171, 174–175, 230–231, 248, 256–257, 259, 264, 267, 272, 278–279, 284–285, 288–289, 292–293, 314, 318**

Hostile attribution bias The tendency to judge ambiguous situations, or the actions of others, as aggressive and/or threatening when in reality they may not be. **332, 349–350, 352**

HPA See Hypothalamic-pituitary-adrenal system (HPA) **256, 276, 288**

Human reproductive behaviour This refers to any behaviours which relate to opportunities to reproduce and thereby increase the survival chances of our genes. It includes the evolutionary mechanisms underlying our partner preferences, such as mate choice and mate competition. **118–119, 142**

Humanistic psychology An approach to understanding behaviour that emphasises the importance of subjective experience and each person's capacity for self-determination. **7, 20–23, 27–28, 31, 99, 102**

Hyperpersonal model **134–135, 141, 145**

Hypothalamic-pituitary-adrenal system (HPA) This controls how the body responds to a chronic stressor. The hypothalamus triggers the pituitary gland to release the hormone ACTH which, in turn, stimulates release of cortisol. **256, 276, 288**

Hypothalamus A small subcortical brain structure made up of two centres – the lateral hypothalamus (LH) and the ventromedial hypothalamus (VMH). **35, 50, 58–59, 209, 219, 230–232, 240, 248–249, 252, 256, 284, 292, 314, 316, 318**

Hypothesis A clear, precise, testable statement that states the relationship between the variables to be investigated. Stated at the outset of any study. **24, 51, 53, 62–63, 70, 72–83, 85–88, 90, 108, 118, 122–123, 125, 127, 133, 138, 140, 144, 158, 204–205, 208–209, 218–219, 227, 241, 247, 252, 259, 273, 279, 283, 291, 293, 300–301, 303–305, 312–315, 317–319, 327–328, 341, 346–347, 360, 377, 384**

Hypothesis testing A key feature of a theory is that it should produce statements (hypotheses) which can then be tested. Only in this way can a theory be falsified. **62, 82–83, 87**

Hypothetico-deductive method Scientific enquiry proceeds from formulating a hypothesis in a form which can be falsified. Predictions are then deduced from the hypothesis and these predictions are tested. **83**

ICD-10 Version 10 of the International Classification of Disorders published by the World Health Organisation in 1993. Version 11 has been published but won't be used for diagnosis until 2022. **202–203, 218**

Id Entirely unconscious, the Id is made up of selfish aggressive instincts that demand immediate gratification. **18–19, 21, 27, 114, 138, 336**

Ideal self The person you would like to be. **18, 20–21, 23, 27, 31**

Identification A desire to be associated with a particular person or group often because the person/group possesses certain desirable characteristics. **12–13, 26, 64, 94, 110, 157, 160–163, 166, 171, 173, 175, 196, 236, 325, 329, 336–337, 349, 359**

Idiographic approach Derived from the Greek 'idios' meaning 'private' or 'personal'. An approach to research that focuses more on the individual case as a means of understanding behaviour, rather than aiming to formulate general laws of behaviour (the nomothetic approach). **23, 64, 104–105, 111, 115**

Imitation Copying the behaviour of others. **12–13, 22, 26, 97, 157, 162, 165, 175, 198–199, 228, 236, 252, 302–303, 315, 334**

Immune system A system of cells within the body that is concerned with fighting against internal or external pathogens such as viruses and bacteria. **256, 258–259, 281, 284–286, 288**

Immunosuppression Stress can cause illness by preventing the immune system from working efficiently and carrying out its usual task of identifying and destroying invading germs and other foreign bodies (pathogens). **258–259, 286**

Importation model **306–307, 314–315, 319, 339**

Imposed etic A technique or theory developed in one culture and then used to study the behaviour of people in a different culture with different norms, values, experiences, etc. **96, 110, 114**

Independent groups design Participants are allocated to different groups where each group represents one experimental or control condition. **14, 70, 74, 76, 91, 189, 209, 217**

Independent variable (IV) Some aspect of the experimental situation that is manipulated by the researcher – or changes naturally – so the effect on the dependent variable (DV) can be measured. **24–25, 52, 68–69, 139, 168, 192–193, 216–217, 246–247, 283, 293, 301, 303, 313, 347, 363**

Indirect reinforcement *See* Vicarious reinforcement **12, 162, 236, 248, 302**

Individualist culture A group of people who value the rights and interests of the individual. This results in a concern for independence and self-assertiveness. People tend to live in small families unlike collectivist societies. **21, 28, 97, 121, 129, 133, 142–143, 170, 265, 284, 288**

Inference The process whereby cognitive psychologists draw conclusions about the way mental processes operate on the basis of observed behaviour. **14–15, 26, 30, 83, 324**

Inferential statistics A type of statistical analysis that permits one to make inferences (i.e. draw conclusions) about an underlying population from a sample of data. **52, 63, 81, 87, 327**

Information processing approach Any theory that equates the mind to a computer: input, processing and output of information. **14, 26, 103**

Informed consent An ethical issue and an ethical guideline in psychological research whereby participants must be given comprehensive information concerning the nature and purpose of the research and their role in it, in order for them to make an informed decision about whether to participate. **41, 45, 54, 57, 106–107, 138–139, 169, 192, 282–283, 312–313**

Infradian rhythm A type of biological rhythm with a frequency of less than one cycle in 24 hours, such as menstruation and seasonal affective disorder. **46, 48–49, 55, 59**

Ingroup Any social group to which you belong, as distinct from the outgroup. **158–159, 170**

Inhibition When a neurotransmitter, such as serotonin, increases the negative charge of the postsynaptic neuron. This *decreases* the likelihood that the postsynaptic neuron will pass on the electrical impulse. **36–37, 54, 244, 272, 293, 319**

Innate Literally means 'inborn', a product of genetic factors. **14, 20, 22, 23, 26–27, 100, 148, 155, 163–164, 171, 179, 185, 189, 194, 226, 228, 248, 250–251, 296–297, 314, 316, 318, 326, 330, 335**

Innate releasing mechanism (IRM) A biological structure or process (e.g. in the brain) which is activated by an external stimulus that in turn triggers a fixed action pattern. **296–297, 316, 318**

Insecure attachment Develops as a result of the caregiver's lack of sensitive responding to the infant's needs. May be associated with poor cognitive and emotional development. **137, 141, 207, 218, 221**

Insecure–avoidant attachment An attachment type characterised by low anxiety but weak attachment. In the Strange Situation this is shown by low stranger and separation anxiety and little response to reunion – an avoidance of the caregiver. **136, 145**

Insecure–resistant attachment An attachment type characterised by strong attachment and high anxiety. In the Strange Situation this is shown by high levels of stranger and separation anxiety and by resistance to being comforted at reunion. **136, 141, 145**

Insight learning **103**

Institutional aggression Aggressive or violent behaviour that takes place within the social context of a prison or other formal organised setting. **291, 306–307, 314, 319**

Instrumental support Practical help such as lending money, cooking a meal, providing information. **280–281, 285**

Inter-interviewer reliability The term used to describe inter-rater reliability when considering interviewers. **66**

Inter-observer reliability The extent to which there is agreement between two or more observers involved in observations of a behaviour. This is measured by correlating the observations of two or more observers. A general rule is that if (total number of agreements) / (total number of observations) > +.80, the data has high inter-observer reliability. **66–67, 86, 90, 129, 227, 297, 365**

Inter-rater reliability Correlating the judgements of two or more ratings of behaviour, as when using a rating scale. Can happen in a questionnaire or interview when behaviour has been rated or in an observation when behaviour has been rated. **65–66, 203, 218, 220**

Inter-sexual selection Mate choice by males or females. **118–119, 140, 142, 144**

Interactional synchrony Mother and infant reflect both the actions and emotions of the other and do this in a co-ordinated (synchronised) way. **97, 110**

Interactionist approach A way to explain the development of behaviour in terms of a range of factors, including both biological and psychological ones. Most importantly such factors don't simply add together but combine in a way that can't be predicted by each one separately i.e. they interact. **100–101, 110, 114, 200, 214–215, 219, 221, 223**

Internal mental processes 'Private' operations of the mind such as perception and attention that mediate between stimulus and response. **14, 26**

Internal validity A kind of validity, concerned with what goes on inside a study – the extent to which the researcher is measuring what was intended. In an experiment, this includes the control of variables to ensure that changes in the dependent variable (DV) are solely due to the independent variable (IV). **68, 90, 265, 373**

Internalisation An individual adopts the attitudes and/or behaviour of another. **160–161, 171, 173, 175, 336**

Internals Individuals with an internal locus of control, attributing the events in their lives to their own decisions and behaviour. **245**

Interpretive validity The match between the meaning attributed to participants' behaviours and the actual participants' perspective. **69**

Intersex A group of conditions where there is a discrepancy between the external genitals and the internal genitals (the testes and ovaries). **148, 153, 166**

Interval data Data measured on a scale where the distance between each value is the same, such as when counting correct answers or using any 'public' unit of measurement. **70–71, 78, 85–86, 185, 328**

Interview A 'live' encounter (face-to-face or on the phone) where one person (the interviewer) asks a set of questions to assess an interviewee's thoughts and/or experiences. The questions may be pre-set (as in a structured interview) or may develop as the interview goes along (unstructured interview). **23, 25, 62, 64, 66–67, 69, 74, 86, 89–90, 95, 104, 107, 111, 119, 156, 166, 173, 187, 207, 215, 229, 237, 239, 267–268, 277, 282–283, 299–300, 322–323, 333, 336–337, 342, 348, 352, 366, 371, 375**

Intra-sexual selection Competition between individuals of the same sex for mates i.e. male–male or female–female. **118–119, 140, 142, 144**

Introduction A look at past research (theory and/or studies) on a similar topic. Includes the aims and hypothesis of current investigation. **9, 62, 70, 81, 87, 113, 148, 165, 200, 202–203, 218, 222–223, 237, 285, 317, 354, 356–357**

Introspection The first systematic experimental attempt to study the mind by breaking up conscious awareness into basic structures of thoughts, images and sensations. **8–10, 26, 28, 30, 366**

Introversion A personality trait where the individual is more inward-focused and thoughtful than an extravert. **330, 348, 352**

Investigative psychology A form of bottom-up profiling that matches details from the crime scene with statistical analysis of typical offender behaviour patterns based on psychological theory. **324–325, 348, 351–352**

Investigator effects Any effect of the investigator's behaviour (conscious or unconscious) on the research outcome (the dependent variable). This may include everything from the design of the study to the selection of, and interaction with, participants during the research process. **62, 69, 237, 261, 311, 375**

Investment The resources associated with a romantic relationship which the partners would lose if the relationship were to end. **117–118, 126, 130–131, 141, 144–145, 298, 318**

IQ Stands for intelligence quotient because it was originally calculated by dividing test score by age. More recent tests use norms to work out a person's IQ based on their score and age. **46, 66, 68–69, 71, 84–85, 97, 100, 105–106, 110–111, 115, 322, 348, 351–352**

Ironic processes theory **244–247, 249, 253**

Irrational beliefs Also called dysfunctional thoughts. In Ellis's model and therapy, these are defined as thoughts that are likely to interfere with a person's happiness. Such dysfunctional thoughts lead to mental disorders such as depression and anorexia. **202, 238–239, 249**

IV *See* Independent variable **69, 139, 150, 203, 231, 246, 327**

Jet lag The disorientation experienced when crossing time zones and having to wake up earlier or stay up later than usual. **50–51, 55, 59**

Job demands-control model **264–265**

Klinefelter's syndrome A syndrome affecting males in which an individual's genotype has an extra X chromosome (in addition to the normal XY), characterised by a tall thin physique, small infertile testes, and enlarged breasts. **154–155, 166, 170, 174**

Knowledge of the physical world Refers to our understanding of how the physical world works. An example of this knowledge is object permanence, the understanding that objects continue to exist when they leave the visual field. There is a debate concerning the ages at which children develop this kind of knowledge. **184–185, 194**

Kohlberg, Lawrence **147, 156–159, 161, 163, 170–172, 332–333, 349, 352**

Kuhn, Thomas **9, 82–83, 87, 91**

Lab (laboratory) Any setting (room or other environment) specially fitted out for conducting research. A lab is not the only place where scientific experiments can be conducted. It is, however, the ideal place for scientific experiments because it permits maximum control. Labs are not used exclusively for experimental research, for example controlled observations are also conducted in labs. **8–11, 13, 15, 22, 24–26, 28–30, 45, 48–49, 55, 62, 68, 83, 95, 98, 110, 123, 125, 161, 163, 217, 243, 249, 259, 271, 284, 300, 308–310, 317, 319, 365, 367**

Laboratory (lab) experiment An experiment that takes place in a controlled environment within which the researcher manipulates the IV and records the effect on the DV, whilst maintaining strict control of extraneous variables. **24, 95, 110, 163, 217, 319, 367**

Lashley, Karl **39, 54**

Latency stage **18–19**

Lateralisation *See* Hemispheric lateralisation **33, 38, 40–41, 54, 57–59, 104**

Latrinalia **65**

Law of equipotentiality

LCU *See* Life change unit **260–261, 266, 284, 288**

Leading question A question which, because of the way it is phrased, suggests a certain answer. For example: 'Was the knife in the accused's left hand?' leads a person to think that's where the knife was. **108**

Learning theory A behaviourist explanation based on the mechanisms of classical and operant conditioning, such as positive and negative reinforcement. **7, 9, 11–13, 22–23, 25–26, 30–31, 102, 111, 114, 149, 156, 158, 162–164, 171, 175, 224, 228–229, 236–237, 248–249, 251–253, 291, 302–303, 309, 310, 315, 317–319, 334, 349, 354, 362–365, 380, 382, 384–385**

Leptin A hormone produced by adipose (fat) cells which acts as a powerful appetite suppressant, contributing to the 'off switch' of eating behaviour. **230–231, 241, 244, 248–249, 252–253**

Levels of explanation The idea that there are several ways (levels) that can be used to explain behaviour. The lowest level considers physiological/biological explanations, the middle level considers psychological explanations and the highest level considers social and cultural explanations. **102–103, 111**

Level of moral reasoning Moral reasoning refers to the way a person thinks about right and wrong. It is presumed that such thinking then applies to moral behaviour. The higher the level, the more that behaviour is driven by a sense of what is right and the less it is driven by just avoiding punishment or avoiding the disapproval of others. **332–333**

Level of significance *See* Significance level **72, 73, 75–76, 78–81, 85, 87, 90, 347**

Levels of measurement Quantitative data can be classified into types or levels of measurement, such as nominal, ordinal and interval. **70–71, 167, 341**

Levels of parasocial relationships A three-step description of one-sided relationships in terms of increasing strength from entertainment-social to intense-personal to borderline-pathological. **136–137, 141**

Lie detection **45**

Lie scale A set of questions in a survey to determine the extent to which the participant's answers are truthful. **69, 86**

Life change unit (LCU) In the Social readjustment rating scale, a measurement of how much psychic cost (stress) any life event creates. **261, 266**

Life changes Significant and relatively infrequent events in people's lives that cause stress. They are stressful because we have to expend psychological energy coping with changed circumstances. **255, 260–263, 266, 270, 282, 284, 286–289**

Life events *See* Life changes **35, 136, 214, 221, 258, 266, 287–288, 358, 380, 384**

Likert scale Respondents can indicate the extent to which they agree or disagree with a statement. There are usually five levels ranging from 'strongly agree' through 'neutral' to 'strongly disagree'. **216**

Limbic system Subcortical structures in the brain (including the hypothalamus and amygdala) thought to be closely involved in regulating emotional behaviour including aggression. **292–293, 314, 316, 318**

Little Hans **19, 104, 111, 115, 160, 171, 173, 175**

Localisation of function The theory that different areas of the brain are responsible for specific behaviours, processes or activities. **33, 38–39, 44, 54, 56, 58–59**

Locke, John **83, 100, 110, 114**

Locus of control (LOC) Refers to the sense we each have about what directs events in our lives. Internals believe they are mostly responsible for what happens to them (internal locus of control). Externals believe it is mainly a matter of luck or other outside forces (external locus of control). **97, 99, 108, 110, 245, 249, 274, 285**

Lombroso, Cesare **326–328, 335, 347–350, 352**

Long-term memory (LTM) The permanent memory store. Coding is mainly semantic. It has unlimited capacity and can store memories for up to a lifetime. **14, 39, 105–106**

Longitudinal Conducting research over a period of time. **64, 86, 90, 125, 159, 181, 183, 187, 195, 258, 269, 334**

LTM *See* Long-term memory **65, 105**

Machine reductionism Explanations which liken human behaviour to that of a machine. This means that such explanations tend to overlook the influence of emotional and social factors. **15, 22, 26, 30, 103**

Mann–Whitney A test for a difference between two sets of scores. Data should be at least ordinal level using an unrelated design (independent groups). **61–62, 70, 74–75, 85, 87–88, 90–91**

MAOA gene The gene responsible for the activity of the enzyme monoamine oxidase in the brain. The low-activity variant of the gene is closely associated with aggressive behaviour. **294–295, 314, 318, 328–329**

Maslow, Abraham **8, 20–21, 27, 31**

Matched pairs design Pairs of participants are first matched on some variable(s) that may affect the dependent variable (DV). Then one member of the pair is assigned to Condition A and the other to Condition B. **70, 75, 91, 108, 158, 193**

Matching hypothesis The belief that we do not select the most attractive person as a prospective partner but, instead, are attracted to people who approximately 'matches' us in physical (i.e. facial) attractiveness. This implies that we take into account our own attractiveness 'value' to others when seeking a romantic partner. **78, 122–123, 138, 140, 144**

Maternal deprivation The emotional and intellectual consequences of separation between a child and his/her mother or mother substitute. Bowlby proposed that continuous care from a mother is essential for normal psychological development, and that prolonged separation from this adult causes serious damage to emotional and intellectual development. **336–337, 349, 353**

Mean The arithmetic average calculated by adding up all the values in a set of data and dividing by the number of values there are. **14, 24, 71, 74, 76, 78, 105, 127, 154, 179, 185, 191, 207, 217, 259, 277**

Measures of central tendency The general term for any calculation of the average value in a set of data. **62–63, 70–71, 81, 131, 168, 282**

Measures of dispersion The general term for any calculation of the spread or variation in a set of scores. **62–63, 70–71, 81, 168, 207, 347, 378**

Media Communication channels, such as TV, film and books, through which news, entertainment, education and data are made available. **12–13, 20, 30, 64, 97, 106, 110, 111, 117, 134–135, 141, 145, 147, 149, 162–165, 169, 171, 174–175, 216, 228–229, 236–237, 242–243, 248–250, 252–253, 281, 291, 302–303, 305, 308–311, 315, 319, 332, 359–360, 364**

Median The central value in a set of data when values are arranged from lowest to highest. **62, 71, 78, 105, 108, 131, 137–138, 168, 179, 191, 216–217, 246, 252, 263, 275, 347**

Mediational processes Cognitive factors (i.e. thinking) that influence learning and come between stimulus and response. **12–13, 26, 162, 171**

Melatonin A hormone produced by the pineal gland that increases sleepiness. In humans it is usually produced at night and is regulated by the suprachiasmatic nucleus. **48, 50–51, 55, 59**

Menstrual cycle **48–49, 55, 59, 152–154**

Mesolimbic pathway Sometimes called the 'reward pathway', it involves several regions of the brain. When activated by a rewarding stimulus (e.g. food, sex), information travels from the ventral tegmental area to the nucleus accumbens and then up to the prefrontal cortex. **360, 362, 368, 384**

Meta-analysis 'Research about research', refers to the process of combining results from a number of studies on a particular topic to provide an overall view. This may involve a qualitative review of conclusions and/or a quantitative analysis of the results producing an effect size. **47, 56, 62, 101, 123, 125, 131, 135, 140, 211, 239–241, 271, 275, 279, 285, 294, 301, 308–309, 314–315, 317, 331, 345, 349, 363, 369, 373, 375, 381, 385**

Metabolite Any substance produced by chemical processes in the body. **232, 240, 251, 292**

Method A description of what the researcher(s) did, including design, sample, apparatus/materials, procedure, ethics. **8–9, 23, 25, 28, 30, 39, 44–45, 55, 57–58, 62, 64–67, 81–83, 86–89, 91, 96, 104, 106–107, 119, 121, 123, 131, 133, 137–138, 165, 173, 184–185, 192, 199, 210, 216, 220, 239, 243, 245–247, 261, 265–267, 269, 272–279, 283, 285, 287, 289, 292, 298, 303, 307, 309–312, 322–323, 344, 351, 361, 363, 365–368, 372, 375, 378–380**

Metrosexual **151**

Miller's Law **105, 115**

Mindfulness **43**

Minimalisation (or minimisation) A type of deception that involves downplaying the significance of an event or emotion. A common strategy when dealing with feelings of guilt. **332–333, 349–350, 352**

Mirror neuron system Consists of special brain cells called mirror neurons distributed in several areas of the brain. Mirror neurons are unique because they fire both in response to personal action and in response to action on the part of others. These special neurons may be involved in social cognition, allowing us to interpret intention and emotion in others. **177, 190–191, 195, 199**

Mode The most frequently occurring value in a set of data. **62, 71, 105, 131, 179, 191**

Modelling From an observer's perspective, modelling is imitating the behaviour of a role model. From the role model's perspective, modelling is the precise demonstration of a specific behaviour that may then be imitated by an observer. **12–13, 22–23, 162–163, 171, 175, 198, 228–229, 236–237, 249–250, 252, 303, 385**

Monozygotic (MZ) twins Identical twins formed from one fertilised egg (or zygote). **16–17**

Morality principle In psychoanalytic theory, the drive to behaviour according to ideas of right and wrong and a social conscience. **18, 27, 336, 353**

Motivation **12, 15, 21, 26–27, 30, 65, 67, 162, 171, 178–179, 194, 202, 218, 230, 240, 248, 275, 277, 289, 302, 307, 315, 324, 349, 352, 357, 366, 376**

Motor area A region of the frontal lobe involved in regulating movement. **38–40, 54, 58**

Motor neurons These connect the CNS (central nervous system) to effectors such as muscles and glands. They have short dendrites and long axons. **36, 54, 199**

MRI Magnetic resonance imaging (MRI) produces a three-dimensional image of the static brain which is very precise. A magnetic field causes the atoms of the brain to change their alignment when the magnet is on and emit various radio signals when the magnet is turned off. A detector reads the signals and uses them to map the structure of the brain. **43, 45, 149, 167, 328**

Multi-store model (MSM) A representation of how memory works in terms of three stores called sensory register, short-term memory (STM) and long-term memory (LTM). It also describes how information is transferred from one store to another, how it is remembered and how it is forgotten. **8, 14, 26, 103**

Mundane realism Refers to how an experiment mirrors the real world. The simulated task environment is realistic to the extent to which experiences encountered in the simulated environment will occur in the real world. **30, 68, 86**

Mutation A genetic change which can then be inherited by any offspring. **204, 218**

Myelin sheath A white fatty substance that protects the neuron and speeds up the transmission of messages along the length of the axon. **36, 54**

MZ twins *See* Monozygotic twins **17, 166, 171, 175, 232–233, 248, 251, 294–295, 329**

Natural experiment An experiment where the change in the independent variable (IV) is not brought about by the researcher but would have happened even if the researcher had not been there. The researcher records the effect on the dependent variable (DV). **137, 141, 183, 237, 264–265, 284, 307**

Natural selection The major process that explains evolution whereby inherited traits that enhance an animal's reproductive success are passed on to the next generation and thus 'selected', whereas animals without such traits are less successful at reproduction and their traits are not selected. **16–17, 27, 30, 49, 118, 140, 296, 298**

Naturalistic observation Watching and recording behaviour in the setting within which it would normally occur. **24–25, 81, 337**

Nature Those aspects of behaviour that are inherited. The term 'nature' does not simply refer to abilities present at birth but to any ability determined by genes, including those that appear through maturation. **8, 11, 13, 15–16, 22–23, 27, 43, 45, 50, 65, 71, 92, 95, 97–101, 104–105, 108–110, 114–115, 127, 132–134, 143, 148, 154–155, 157, 161, 164–165, 170–171, 175, 182, 184–185, 187, 189, 195–196, 214, 216, 218, 221, 231, 233, 238, 274, 286, 295, 303, 305–306, 314–315, 322, 324, 326–327, 329, 331, 335, 338, 348–349, 357, 372, 377, 380**

Nature–nurture debate Concerned with the extent to which aspects of behaviour are a product of inherited or acquired characteristics. **92, 100–101, 110, 114–115, 154–155, 164–165, 170, 221**

Negative affect theory **301, 315, 317–318**

Negative correlation As one co-variable increases, the other decreases. For example, the following two co-variables: the number of people in a room and amount of personal space are negatively correlated. **53, 63, 90, 187, 195, 243, 271, 288, 292, 346**

Negative reinforcement In operant conditioning, a stimulus that increases the probability that a behaviour will be repeated because it leads to escape from an unpleasant situation and is experienced as rewarding. **10, 29–30, 302, 340, 362, 364, 380, 384**

Negative symptoms of schizophrenia Atypical experiences that represent the *loss* of a usual experience such as a loss of clear thinking or a loss of motivation. **202, 204**

Neophobia An innate predisposition to avoid anything new. An adaptive behaviour which reduces the risks of unfamiliar objects, experiences and activities until we learn they are safe. **226–227, 248, 250, 252**

Nervous system Consists of the central nervous system and the peripheral nervous system. Communicates using electrical signals. **24, 33–37, 54, 58–59, 98, 231–232, 240, 256–266, 272, 287, 292, 310, 328, 330, 346, 348, 360**

Neural correlates Patterns of structure or activity in the brain that occur in conjunction with an experience and may be implicated in the origins of that experience. **204–205, 218, 222**

Neural explanation Any explanation of behaviour (and its disorders) in terms of (dys)functions of the brain and nervous system. This includes the activity of brain structures such as the hypothalamus and prefrontal cortex, and neurotransmitters such as serotonin and dopamine. **232–233, 237, 240–241, 248–249, 251, 328–329, 348**

Neural networks A structure of interconnected neurons, each with multiple connections. **37**

Neurochemistry Relating to chemicals in the brain that regulate biological and psychological functioning. **16, 231, 248, 354, 360–362, 368, 380, 382, 384–385**

Neurological Related to neurons/nervous system. **14, 39, 44, 149, 190, 214, 218**

Neuron The basic building blocks of the nervous system, neurons are nerve cells that process and transmit messages through electrical and chemical signals. **13, 22, 26, 33–34, 36–37, 44–45, 54–55, 58–59, 166, 177, 190–191, 195, 199, 205, 208, 230, 272, 292–293, 296, 316, 318, 328, 348, 360, 368**

Neurorehabilitation **43**

Neuroses A personality or mental disturbance characterised by anxiety but where the individual has not lost touch with reality, as distinct from psychosis. **19**

Neurosurgery **39, 54**

Neurotransmitter Brain chemicals released from synaptic vesicles that relay signals across the synapse from one neuron to another. Neurotransmitters can be broadly divided into those that perform an excitatory function and those that perform an inhibitory function. **16–17, 27, 36–37, 54, 58, 102–103, 111, 113, 204–205, 208, 221–222, 230, 232–233, 240–241, 248–249, 251–253, 272, 292, 294, 328, 356, 360–361, 368, 382, 384**

Neurotypical A shortened version of 'neurologically typical', referring to someone who has developmental, intellectual and cognitive abilities which are the most usual. **41, 44, 189, 191, 193, 199**

Neutral stimulus (NS) In classical conditioning, the stimulus that initially does not produce the target response, i.e. it is neutral. Through association with the unconditioned stimulus (UCS), the NS acquires the properties of the UCS and becomes a conditioned stimulus (CS) producing a conditioned response (CR). **10**

Nicotine addiction **354, 360–364, 368, 371, 376–377, 380–382, 384–385**

Nicotine replacement therapy (NRT) **361, 368**

Nodes of Ranvier The gaps in the myelin sheath that protect the axon of a neuron. **36, 54**

Nominal data A level of measurement, data that is in separate categories. **70–71, 86–87, 90**

Nomothetic approach Derived from the Greek 'nomos' meaning 'law'. The nomothetic approach aims to study human behaviour through the development of general principles and universal laws. **23, 92, 104–105, 111, 115**

Non-directional hypothesis A form of hypothesis that states a difference, correlation or association between two variables but does not specify the direction (i.e. does not specify more or less, positive or negative) of such a relationship. **24, 73, 85, 88, 127, 241, 273, 301**

Non-participant observation The researcher remains outside of the group whose behaviour he/she is watching and recording. **62**

Noradrenaline A hormone and a neurotransmitter that generally has an excitatory effect, similar to the hormone adrenaline. The hormone is produced by the adrenal gland. **233, 248, 252, 256, 259, 264, 268, 272, 289, 318**

Normal distribution A symmetrical spread of frequency data that forms a bell-shaped pattern. The mean, median and mode are all located at the highest peak. **71, 86–87, 105**

Nucleus The control centre of a cell containing genetic material. **36, 43, 46, 50, 54–55, 152, 166, 230–231, 248, 360, 362, 368, 384**

Nucleus accumbens A part of the mesolimbic pathway, the reward pathway of the brain. **360, 362, 368, 384**

Null hypothesis The statement of no difference, correlation or association between variables being studied. **70, 72–80, 82–83, 85–87, 90, 347**

Nurture Those aspects of behaviour that are acquired through experience, i.e. learned from interactions with the physical and social environment. **16, 22–23, 27, 50, 92, 98, 100–101, 108–110, 114–115, 124, 148, 154–155, 157, 161–162, 164–165, 170–171, 187, 189, 195, 221, 234, 295, 303, 305–306, 314–315, 326–327, 329, 335, 348–349**

Obedience A form of social influence in which an individual follows a direct order. The person issuing the order is usually a figure of authority who has the power to punish when obedient behaviour is not forthcoming. **68, 340**

Obesity Having too much body fat, often defined as a BMI (weight divided by the square of the person's height) of more than 30. **224, 230, 240–243, 248–249, 253, 258**

Object permanence The ability to realise that an object still exists when it passes out of the visual field. Piaget believed that this ability appears at around eight months of age. Prior to this, children lose interest in an object once they can't see it and presumably are no longer aware of its existence. **180–181, 184–185, 194, 198–199**

Objectivity All sources of personal bias are minimised so as not to distort or influence the research process. **10, 62, 65, 82–83, 87, 91, 104–105, 111, 170**

Observation A research study where only observational techniques are used. **8, 12–13, 15, 22–26, 40, 49, 51–52, 55, 62, 64–69, 81–83, 86–87, 103–104, 107, 111, 129, 157, 163, 165, 168–169, 187, 207, 218, 227, 236, 243, 249, 267, 297, 299, 302–303, 312, 314–315, 334, 337, 353, 364–365, 380, 385**

Observational learning Learning through imitation. **13, 23, 236, 302–303, 315, 334, 353, 385** *Also see* Social learning theory.

Observational techniques A set of systems to increase the objectivity and validity of data collected when a researcher watches or listens to participants engaging in whatever behaviour is being studied. Observational techniques may be used in an experiment as a method of assessing the dependent variable (DV). **25, 62**

Observer bias In observational studies there is a danger that observers' expectations affect what they see or hear. This reduces the validity of the observations. **165, 171, 314, 365, 384**

Obsessive-compulsive disorder (OCD) A condition characterised by obsessions and/or compulsive behaviour. **102**

Occipital lobe **38–39, 40, 56, 58**

OCD *See* Obsessive-compulsive disorder **14, 16, 39, 54, 100–102, 110–111, 114, 202–203, 218, 273, 369**

Oedipus complex Freud's explanation of how a boy resolves his love for his mother and feelings of rivalry towards his father by identifying with his father. **19, 31, 160–161, 171, 173, 175, 336**

Oestrogen The primary female hormone, playing an important role in the menstrual cycle and reproductive system. **48, 55, 152, 155, 170, 174, 278–279**

Offender profiling A behavioural and analytical tool that is intended to help investigators accurately predict and profile the characteristics of unknown criminals. **320, 322–325, 327, 348, 350–353**

One-tailed test Form of test used with a directional hypothesis. **73, 75–80**

Open question Question for which there is no fixed choice of response and respondents can answer in any way they wish; for example 'why did you take up smoking?' **67, 229, 283, 371**

Operant conditioning A form of learning in which behaviour is shaped and maintained by its consequences. Possible consequences of behaviour include reinforcement (positive or negative) and punishment. **10–13, 23, 26, 29–30, 212, 219, 228, 248, 276–277, 285, 302, 308, 315, 340, 349, 353, 360, 362–363, 370, 380, 382, 384–385**

Operationalisation Clearly defining variables in terms of how they can be measured. **62, 111**

Operations The term used in Piaget's theory of cognitive development for internally consistent, logical mental rules, such as rules of arithmetic. **9, 14–15, 103, 180–181, 194, 198**

Opportunity sampling A sample of participants produced by selecting people who are most easily available at the time of a study. **123, 239, 247, 259, 283, 309, 378**

Optic chiasm **46, 50, 55**

Oral stage In psychoanalytic theory, the first stage (0–18 months) of psychosexual development when the organ-focus is on the mouth. **160**

Orbitofrontal cortex **292–293, 314**

Ordinal A level of measurement. Data is ordered in some way but the intervals between each item are unequal. **62, 70–71, 74–75, 78, 85–87, 91, 347**

Organised offender An offender who shows evidence of planning, targets a victim and tends to be socially and sexually competent with higher-than-average intelligence. **322–323, 348, 352**

Outgroup Any social group to which you do not belong, as distinct from the ingroup. **158**

Oxytocin A hormone which causes contraction of the uterus during labour and stimulates lactation. **94, 152–153, 170, 174, 257, 278–279, 284–285, 289**

Paradigm A set of shared assumptions and agreed methods within a scientific discipline. **9, 26, 62, 82–83, 87, 91**

Paradigm shift The result of a scientific revolution when there is a significant change in the dominant unifying theory within a scientific discipline. **62, 82–83, 87**

Parahippocampal gyrus An area of the cerebral cortex (grey matter) that surrounds the hippocampus. Involved in memory. **14**

Parametric test A group of inferential statistics that make certain assumptions about the parameters (characteristics) of the population from which the sample is drawn. **61, 70–71, 74–75, 77, 79, 85–87, 90–91**

Parapraxes A Freudian slip, a minor error in action, such as a slip of the tongue. Due to repressed emotions. **18**

Parasocial relationship The prefix 'para' means 'resembling' so parasocial relationships are those which are similar to 'normal' relationships but lack a key element. They are a one-sided, unreciprocated relationship, usually with a celebrity, on which the 'fan' expends a lot of emotional energy, commitment and time. **117, 136–137, 139, 141, 145**

Parasympathetic nervous system A division of the autonomic nervous system (ANS) which controls the relaxed state (rest and digest), conserving resources and promoting digestion and metabolism. The parasympathetic branch works in opposition to the sympathetic branch of the ANS. One or the other is active at any time. **34–35, 256**

Parietal lobe/cortex **38–39, 42, 54, 58, 352**

Pars opercularis **191, 195**

Partial reinforcement A behaviour is reinforced only some of the time it occurs (e.g. every tenth time or at variable intervals). **30, 364–365, 380**

Participant reactivity The tendency for participants to react to cues from the researcher or the research environment. **69**

Participant variables Characteristics of individual participants (such as age, intelligence, etc.) that might influence the outcome of a study. **217, 318**

Pavlov, Ivan **10, 26, 29**

Pearson's *r* A parametric test for a correlation when data is at interval level. **62, 70–71, 77, 79, 87**

Peek, Kim **41**

Peer review The assessment of scientific work by others who are specialists in the same field to ensure that any research set for publication is of high quality. **47, 62, 101, 107, 131**

Peer tutoring An effective form of learning, recommended by Vygotsky's theory of cognitive development because peers are potential 'experts' (individuals with greater knowledge). **183, 194, 196, 198**

Peers People who share our interests and are of similar age, social status and background to ourselves. Peers become more influential in adolescence, when we spend more time with them and less with family. **149, 154, 162–163, 171, 182–183, 192, 194, 196, 228, 248, 302–303, 332, 334, 356, 358–359, 380–381, 383–384**

Peers (in relation to addiction) The attitudes of peers towards addictive substances/behaviours becomes highly influential in increasing the risk of an addiction developing in adolescence. **358**

Penis envy A girl's recognition of not having a penis, and desire to have one. **19, 68, 160–161, 171, 173, 175**

Perfectionism **238–239, 249, 253**

Peripheral nervous system (PNS) Sends information to the CNS from the outside world, and transmits messages *from* the CNS to muscles and glands in the body. **34, 36**

Personality Patterns of thinking, feeling and behaving that differ between individuals. These are relatively consistent from one situation to another, and over time. **18–19, 21–22, 27, 39, 41, 67, 81, 100, 105, 107, 115, 122, 141, 150–151, 158, 173, 202, 207, 214, 216, 223, 259, 264, 268–271, 284–285, 288–289, 292, 306, 323, 328, 330–331, 336, 346, 348, 351–352, 356–359, 361, 379–380, 383–384**

Personality (in relation to addiction) Various traits can increase an individual's risk of addiction, a significant one being impulsivity. **358**

Perspective-taking Our ability to appreciate a social situation from the perspective (point of view) of other people. This cognitive ability underlies much of our normal social interaction. Referred to specifically as 'social perspective-taking' or also called 'role-taking' because we take on the role of another and therefore their perspective. **177, 186–187, 189–191, 195, 197, 199, 332, 349**

PET scan Positron emission tomography. A brain-scanning method used to study activity in the brain. Radioactive glucose is ingested and can be detected in the active areas of the brain. **14, 41**

Phallic stage In psychoanalytic theory, the third stage of psychosexual development when the organ-focus is on the genitals. **18–19, 94, 160–161, 171, 173, 336, 349**

Phase model of relationship breakdown An explanation of the stages people go through when their relationship is not working. Once one partner is dissatisfied, there are four phases in the process, each with a different focus: intra-psychic, dyadic, social and grave dressing. **132–133, 143**

Phenotype The characteristics of an individual determined by both genes *and* the environment. **16–17, 22, 27–28, 30**

Phenylketonuria (PKU) An inherited disorder that prevents metabolism of phenylalanine, resulting in a build-up of poisonous substances that cause brain damage. If the disorder is detected at birth, the individual can be given a diet that avoids phenylalanine and thus prevents the potential brain damage. **17**

Pheromones Chemical substances produced by the body and secreted into the air, from where they are transmitted to other animals of the same species and absorbed into their bloodstream. The pheromones then work like hormones and influence the behaviour of the receiver. **48, 55, 59**

Phobia An irrational fear of an object or situation. **11, 19, 23, 64, 81, 104, 111, 160, 226–227, 248, 250, 252, 370**

Phototherapy **49**

Physical attractiveness An important factor in the formation of romantic relationships. The term usually applies specifically to how appealing we find a person's face. There is general agreement within and across cultures about what is considered physically attractive, and an assumption that we seek to form relationships with the most attractive person available. **78, 117, 119, 122–123, 138, 140, 144–145, 164**

Physical dependence A state of the body due to habitual substance abuse which results in a withdrawal syndrome when use of the drug is reduced or stopped. **356–357, 384**

Piaget, Jean **156–157, 170, 174, 177–186, 189, 192, 194–196, 198–199**

Pilot study A small-scale version of an investigation that takes place before the real investigation is conducted. The aim is to check that procedures, materials, measuring scales, etc., work and to allow the researcher to make changes or modifications if necessary. **25, 66, 86, 129, 168, 227, 297, 363, 365**

Pineal gland **48, 50–51, 55, 59**

Pituitary gland Called the master gland of the body's hormone system because it directs much of the hormone activity. **35, 58–59, 256**

PKU *See* Phenylketonuria. **16–17, 28**

Placebo A treatment that should have no effect on the behaviour being studied, it contains no active ingredient. Therefore it can be used to separate out the effects of the independent variable (IV) from any effects caused merely by receiving any treatment. **17, 51, 72, 153, 209, 219, 273, 277, 285, 293, 312, 314, 363, 369, 371, 380–381, 385**

Plasticity This describes the brain's tendency to change and adapt as a result of experience and new learning. This generally involves the growth of new connections. **33, 41–43, 54, 58–59**

Pleasure principle In psychoanalytic theory, the drive to do things which produce pleasure or gratification, and to avoid pain. **18, 27**

PNS *See* Peripheral nervous system. **34, 36–37, 54, 58**

Polygenic A characteristic determined by more than one gene. **204, 218, 233, 240, 248–249, 251**

Popper, Karl **17, 19, 27, 83, 91, 161**

Population A group of people who are the focus of the researcher's interest, from which a smaller sample is drawn. **16, 62, 68, 71–72, 76–77, 81, 85, 87, 90, 100, 106–107, 110, 118, 124, 165, 192, 202, 204, 216, 222, 232, 244, 269, 282–283, 292, 327, 331, 338–339, 341, 343, 360**

Positive correlation As one co-variable increases so does the other. For example, the number of people in a room and noise are positively correlated. **35, 42, 52, 63, 78–79, 90, 138, 140, 165, 187, 204, 260, 262, 286, 292, 308, 315, 318–319, 359**

Positive reinforcement In operant conditioning, a stimulus that increases the probability that a behaviour will be repeated because it is pleasurable. **10, 30, 342, 353, 362, 364–365, 380, 384**

Positive symptoms of schizophrenia Atypical symptoms experienced in *addition* to normal experiences. They include hallucinations and delusions. **202–203**

Post-mortem examinations The brain is analysed after death to determine whether certain observed behaviours during a person's lifetime can be linked to structural abnormalities in the brain. **44–45**

Post-traumatic stress disorder (PTSD) A disabling reaction to stress following a traumatic event. The response does not always appear immediately after the event. The reactions are long-lasting, and include: reliving the event recurrently in flashbacks and dreams, emotional numbness and general anxiety which may result in lack of concentration. **203, 275, 345**

Postsynaptic neuron The neuron that is receiving the information at the synapse. **37, 54, 205, 208, 272**

Postsynaptic receptor site A receptor on the neuron that is receiving the information at the synapse. A neurotransmitter locks into a specific receptor on the receiving neuron and this triggers an electrical signal in the receiving neuron. **37, 54**

Preconscious Consists of information and ideas that could be retrieved easily from memory and brought into consciousness. **18, 31**

Prefrontal cortex A region in the frontal lobe which is involved with highest-order cognitive activities, such as working memory. **14, 39, 204, 328–329, 348, 352**

Presynaptic neuron The transmitting neuron, before the synaptic cleft. **37, 205, 208**

Presynaptic terminal The end of the transmitting neuron, ending at the synaptic cleft. **37, 58**

Primary data Information that has been obtained first hand by the researcher for the purposes of a research project. In psychology, such data is often gathered directly from participants as part of an experiment, self-report or observation. **363**

Primary reinforcer Things that are innately reinforcing, such as food or warmth. **212, 219–220, 223, 340, 362, 380**

Prior general consent Prospective participants in a research study are asked if they would take part in certain kinds of research, including ones involving deception. If they say yes they have given their general consent to taking part in such research. **312**

Privacy An ethical issue that refers to a zone of inaccessibility of mind or body and the trust that this will not be 'invaded'. Contrasts with confidentiality. Can be dealt with in some situations by providing anonymity. **106, 234, 282, 312–313, 378–379**

Probability A measure of the likelihood that a particular event will occur where 0 indicates statistical impossibility and 1 statistical certainty. **60–62, 72–73, 75, 87–88, 90–91, 204–205, 346, 366, 372, 378**

Prochaska's six-stage model Explains the stages people go through to change their behaviour. It identifies six stages of change (and is sometimes referred to as the 'Stages of change' model), from not considering it at all to making permanent changes. The stages are not necessarily followed in a linear order. **376–377**

Prosocial behaviour Behaviour which is beneficial to others, and may not necessarily benefit the helper. **304–305**

Prospective A longitudinal study that selects participants on the basis of certain characteristics to see how these characteristics affect later behaviours of interest. **106, 122, 155, 170, 243, 260–261, 264, 268, 284–285, 334**

Protection from harm *See* Psychological harm **169, 312**

Pseudoscientific A claim, belief, or practice that is presented as scientific but is not following the scientific method. **19, 27, 115, 161, 171, 173**

Psychic determinism The belief that behaviour is caused by unconscious psychodynamic conflicts that we cannot control. **19, 23, 27, 31, 98, 110, 113**

Psychoactive drugs A chemical substance that alters one's mental processes. **17, 27, 37**

Psychoanalysis A form of psychotherapy, originally developed by Sigmund Freud, that is intended to help people become aware of long-repressed feelings and issues by using techniques such as free association and dream analysis. **8, 19, 21, 23, 27, 173**

Psychodynamic approach/explanation A perspective that describes the different forces (dynamics), most of which are unconscious, that operate on the mind and direct human behaviour and experience. **7–9, 18–23, 26–27, 31, 94, 104, 153, 160, 173, 336–337, 349**

Psychological dependence A compulsion to continue taking a substance (or continue performing a behaviour) because its use is rewarding. **356–357, 380, 384**

Psychological harm Participants in psychological research should not experience embarrassment, loss of self-esteem or any other psychological damage – greater than what they might expect to experience in everyday life. **106, 371, 378**

Psychological test A set of questions or task that assesses some aspect of psychological functioning, such as intelligence or personality. **64, 66, 68–69, 71, 86, 104, 330–331**

Psychology The scientific study of the mind, behaviour and experience. **8**

Psychopathy Lacking a conscience and empathy for others, making it more likely that an individual will commit crimes and have difficulty forming relationships. **292, 328–329, 336, 349**

Psychosexual stages Five developmental stages that all children pass through. At each stage there is a different conflict, the outcome of which determines future development. **18, 22, 27, 160, 171**

Psychosis A severe mental disorder where a person has lost touch with reality. The whole person is affected, behaviour is qualitatively different from before and the person lacks insight into their condition (as distinct from a neurosis). **202, 205, 208–209, 218, 339, 348**

Punishment Any procedure that decreases the likelihood that a behaviour will be repeated because the overall experience is unpleasant. **10, 26, 29–30, 98, 171, 198, 300, 302, 332–333, 335–338, 340, 345, 348–349, 353, 371, 381, 384**

Qualitative data analysis Any means of extracting meaning from data that focuses more on words (i.e. what participants say) than on forms of numerical data. Qualitative analyses interpret the meaning of an experience to the individual(s) concerned. **65**

Qualitative data Data that is expressed in words and non-numerical (although qualitative data may be converted to numbers for the purposes of analysis). **62, 64, 65, 86, 115, 121, 156, 169, 215, 235, 265, 277, 299, 309, 359**

Qualitative methods *See* Qualitative data analysis **23, 69, 81, 95, 102, 105, 151**

Quantitative data analysis Any means of extracting meaning from data that uses numerical data as the basis for investigation and interpretation (e.g. descriptive or inferential statistics). **65**

Quantitative data Data that can be counted, usually given as numbers. **62, 64–65, 70–71, 86, 115, 119, 169, 193, 217, 237, 246, 299, 379**

Quasi-experiment A study that is almost an experiment but lacks key ingredients. The independent variable (IV) has not been determined by anyone (the researcher or any other person) – the 'variables' simply exist, such as being old or young. Strictly speaking this is not an experiment. **17, 25, 62, 91, 108, 137–139, 168, 192–193, 261, 282–283, 313, 378**

Questionnaire A set of written questions (sometimes referred to as 'items') used to assess a person's thoughts and/or experiences. **25, 35, 49, 62, 64–67, 69, 71, 75, 86, 90–91, 104, 108, 119, 122, 125, 127, 131, 138–139, 151, 165, 174, 192, 215–216, 229, 233, 237, 239, 258, 264, 267, 269, 271, 273, 275, 277–280, 282–283, 299, 330, 331, 333, 341–342, 346, 371, 375, 377, 379–381**

Random allocation An attempt to control for participant variables in an independent groups design which ensures that each participant has the same chance of being in one condition as any other. **62, 289, 307, 347, 373, 381**

Random sampling A sample of participants produced by using a random technique such that every member of the target population being tested has an equal chance of being selected. **62, 122, 307, 323**

Random technique A method that ensures that each item has an equal chance of being selected i.e. there is no predictable pattern. This can be achieved with random number tables or numbers drawn from a hat. **62, 192, 247**

Range A simple calculation of the dispersion in a set of scores which is worked out by subtracting the lowest score from the highest score and usually adding 1 as a mathematical correction. **62, 71, 108, 137, 168, 191, 347**

Rating scale A means of assessing attitudes or experiences by asking a respondent to rate statements on a scale of 1 to 3 or 1 to 5, etc. Produces ordinal data. **138, 150, 260, 263, 266–267, 284, 287, 347, 373**

Raw scores Original data that has not been transformed in any way, for example by working out an average. **71**

Reality principle In psychoanalytic theory, the drive to accommodate to the demands of the environment in a realistic way. **18, 27, 353**

Recidivism Reoffending, a tendency to relapse into a previous condition or mode of behaviour. In the context of crime, a convicted criminal who reoffends, usually repeatedly. **338–340, 343–345, 348–349, 353**

Reciprocal determinism A person's behaviour both influences and is influenced by personal factors and the social environment. **13, 23, 26, 31**

Reduced cues theory **134–135, 141, 145**

Reductionism The belief that human behaviour is best understood by studying the smaller constituent parts. **15, 21–23, 26, 30, 92, 99, 102–103, 111–112, 114–115, 143, 197**

References List of sources that are referred to or quoted in the article (e.g. journal articles, books or websites) and their full details. **65, 81, 91, 113, 197, 221**

Reflexive In qualitative research, a researcher reflects or thinks critically during the research process about the factors that affect the behaviour of both researchers and participants. This reflective process recognises the social dynamics of the research process and how this affects data collected. **107, 111**

Reinforcement A consequence of behaviour that increases the likelihood of that behaviour being repeated. Can be positive or negative. **10–13, 22, 26, 29–30, 98, 103, 110, 113, 132, 162–163, 171, 175, 198, 212, 220, 228–229, 236–237, 248–249, 302–303, 309, 315, 317–318, 340–342, 353, 362, 364–365, 380, 382, 384–385**

Related designs *See* Repeated measures and Matched pairs design **70**

Related *t*-test A parametric test for a difference between two sets of scores. Data must be interval level with a related design i.e. repeated measures or matched pairs. **62, 70–71, 77, 85**

Relay neurons These connect the sensory neurons to the motor or other relay neurons. They have short dendrites and short axons. **36**

Reliability Refers to how consistent a measuring device is – and this includes psychological tests or observations which assess behaviour. **15, 25, 53, 61–62, 65–67, 83–84, 86, 89–91, 105, 125, 129, 151, 169, 199, 202–203, 218, 220, 222, 227, 237, 245, 263, 265, 297, 325, 333, 365, 371, 380**

REM (rapid eye movement) sleep **48, 55**

Repeated measures All participants take part in all conditions of the experiment. **24, 62, 70, 75, 77, 85–86, 91, 158, 217**

Replicability The extent to which scientific procedures and findings can be repeated by other researchers. **62, 82–83, 87, 91, 115**

Replication The opportunity to repeat an investigation under the same conditions in order to test the validity and/or reliability of its findings. **83, 97, 104, 133**

Repression A form of Ego defence whereby anxiety-provoking material is kept out of conscious awareness as a means of coping. **18, 27, 31, 268, 285**

Research methods The processes by which information or data is collected usually for the purpose of testing a hypothesis and/or a theory. **24, 52–53, 62, 81, 85, 108–109, 138–139, 168–169, 193, 216–217, 243, 246, 249, 259, 282–284, 303, 308–309, 312–313, 315, 327, 346–347, 378–379**

Restorative justice A system for dealing with offending behaviour which focuses on the rehabilitation of offenders through reconciliation with victims (survivors). This enables the offender to see the impact of their crime and serves to empower survivors by giving them a 'voice'. **320, 344–345, 349, 353**

Restraint theory A cognitive explanation which argues that obesity is the paradoxical outcome of attempts to restrain eating (i.e. dieting). **242–243, 249**

Results A description of what the researcher(s) found, including descriptive and inferential statistics. **24–25, 38, 46, 52, 56, 62, 66–69, 72–73, 75, 81, 84, 86–89, 95, 97, 108, 123, 125, 130, 138, 151, 168, 170, 185, 191–192, 202, 205, 207, 209, 211, 213, 216–217, 219, 232–233, 239, 246, 251, 271, 281–283, 287, 289, 294–295, 309–310, 312–313, 317, 325, 341, 345–346, 348–349, 356, 360, 369, 377–379, 381**

Review A consideration of a number of studies that have investigated the same topic in order to reach a general conclusion about a particular hypothesis. **39, 45, 81, 96, 114, 179, 183, 191, 195, 203, 207, 209, 211, 213, 232, 273, 285, 293, 345, 351, 377, 381**

Right to withdraw An ethical issue. Participants should have the right to withdraw from participating in a research study if they are uncomfortable with the study. **52, 138–139, 169, 192, 216, 282–283**

Risk factors Any internal or external influence that increases the likelihood a person will start using addictive substances or engage in addictive behaviours. **205–206, 218, 235, 258, 261, 264, 268, 329, 334, 354, 356–359, 374, 379–380, 383–385**

Risperidone **208, 219**

Rogers, Carl **8, 20–21, 23, 27, 31, 99, 104, 111**

Role model People who have qualities we would like to have and we identify with, thus we model or imitate their behaviour and attitudes. **12, 23, 26, 30, 113, 156–159, 162–164, 170–171, 174–175, 228, 236, 317, 328**

Role play A technique used in research studies where participants are asked to imagine how they would behave in certain situations, and act out the part. **274, 342–343, 349, 372, 381**

Rule of R **73, 87**

Rusbult, Caryl **117, 130–131, 141, 145**

Sally–Anne study Uses the Sally–Anne task to assess theory of mind. To understand the story participants have to identify that Sally will look for a marble in the wrong place because she does not know that Anne has moved it. Autistic children and very young non-autistic children find this challenging. **188–189, 195, 197**

Sample A group of people who take part in a research investigation. The sample is drawn from a (target) population and is presumed to be representative of that population, i.e. it stands 'fairly' for the population being studied. **9, 24, 43, 47–48, 54, 62, 65, 67, 72, 74, 76, 81, 83–88, 90–91, 101, 104, 108–109, 125, 138, 151, 153, 167–170, 179, 192, 203, 211, 216, 233, 235, 237, 241, 245, 249, 258–259, 263–264, 269, 271, 279, 282–284, 292–293, 295, 299, 319, 323, 325, 327, 331, 334–336, 345–346, 348, 351, 361, 363, 375, 379**

Sampling techniques The methods used to select people from the population. **62, 216**

Satisfaction The extent to which romantic partners feel the rewards of the relationship exceed the costs. **121, 125–131, 136, 140–141, 145, 236, 241, 345**

Scaffolding The process of helping a learner cross the zone of proximal development (ZPD) and advance as much as they can, given their stage of development. Typically the level of help given in scaffolding declines as the learner crosses the zone of proximal development. **182–183, 194, 196, 198**

Scanning Used for research purposes and also used to record the structure and action of the brain and body, such as PET scans and MRI scans. This is done for research and also to detect abnormalities such as tumours. **8, 14, 16–17, 27, 44–45, 55, 95, 191, 195, 199, 205, 218**

Scattergram A type of graph that represents the strength and direction of a relationship between co-variables in a correlational analysis. **62–63, 90, 138, 233, 282**

Schema A mental framework of beliefs and expectations that influence cognitive processing. They are developed from experience. **14–15, 22, 26, 28, 30, 147, 153, 157–159, 163, 170, 174–175, 178–179, 194, 198**

Schizophrenia A severe mental disorder where contact with reality and insight are impaired, an example of psychosis. **16, 19, 21, 27, 53, 74, 101, 105, 110–111, 200, 202–223, 328, 339, 360–361, 380, 382, 384**

Schizophrenogenic mother A psychological explanation for schizophrenia. A mother who is both cold and rejecting, and overprotective and domineering creates the potential for schizophrenia in her child. **206–207, 210, 214, 218–219, 222–223**

Science A means of acquiring knowledge through systematic and objective investigation. The aim is to discover general laws. **8–9, 14–15, 17, 19, 21–22, 26, 30, 39, 44, 47, 61–62, 71, 81–83, 87, 91, 95, 97–99, 102–103, 105, 109–113, 115, 161, 176, 179, 191, 309, 322, 327, 333, 336**

Scientific racism The use of apparently scientific research to support or justify a belief in the superiority of one ethnic group. **327**

SCN *See* Suprachiasmatic nucleus **43, 46, 50–51, 54–55, 59**

SCR *See* Skin conductance response **266–267**

Seasonal affective disorder (SAD) Depression associated with seasonal changes, usually the onset of winter and increased darkness. **48–50, 55, 59**

Secondary data Information that has already been collected by someone else and so pre-dates the current research project. In psychology, such data might include the work of other psychologists, or government statistics. **62, 95, 160, 263, 323**

Secondary reinforcers A reinforcer that has no natural properties of reinforcement but through association with a primary reinforcer, has become a reinforcer. In other words it is learned or conditioned. It is sometimes called a conditioned reinforcer. **212, 219–220, 223, 340, 349, 362, 364, 380**

Secure attachment Generally thought of as the most desirable attachment type, associated with psychologically healthy outcomes. In the Strange Situation this is shown by moderate stranger and separation anxiety and ease of comfort at reunion. **96**

Selective reinforcement Aiming to increase the occurrence of certain behaviours using rewards and extinguish undesirable behaviours by not responding to those, hence the reinforcing response is said to be selective. **212**

Selective serotonin reuptake inhibitor (SSRI) An antidepressant group of drugs that increase available amounts of serotonin by preventing their reabsorption by the transmitting neuron. **37**

Self The ideas and values that characterise 'I' and 'me' and includes perception and valuing of 'what I am' and 'what I can do'. **18, 20–23, 27, 31, 113**

Self-actualisation The desire to grow psychologically and fulfil one's full potential – becoming what you are capable of. **20–21, 27–28, 31, 99**

Self-concept The self as it is currently experienced, all the attitudes we hold about ourselves. **20–23**

Self-disclosure Revealing personal information about yourself. Romantic partners reveal more about their true selves as their relationship develops. These self-disclosures about one's deepest thoughts and feelings can strengthen a romantic bond when used appropriately. **117, 120–121, 124, 129–130, 132, 134–135, 140–141, 144–145**

Self-efficacy One's confidence in being able to do something. Such confidence generates expectations and these act as self-fulfilling prophecies. **164, 171, 265, 284, 302, 315, 318, 366, 374, 380–381, 384**

Self-esteem The feelings that a person has about their self-concept. **20, 23, 27, 126, 136, 144, 158, 192, 233, 244–245, 249, 253, 270, 344**

Self-report technique Any method in which a person is asked to state or explain their own feelings, opinions, behaviours and/or experiences related to a given topic. **62, 287**

Selman, Robert **177, 186–187, 195, 199**

Semantic memory A long-term memory store for our knowledge of the world. This includes facts and our knowledge of what words and concepts mean. These memories usually also need to be recalled deliberately. **14**

Semi-structured interview An interview that combines some predetermined questions (as in a structured interview) and some questions developed in response to answers given (as in an unstructured interview). **283**

Sensorimotor stage The first stage in Piaget's theory of cognitive development. The infant practises and learns to co-ordinate sensory and motor responses, such as hand-eye. **180, 184, 194**

Sensory neurons These carry messages from the PNS (peripheral nervous system) to the CNS (central nervous system). They have long dendrites and short axons. **36, 199**

Separation anxiety Distress shown by an infant when separated from an attachment figure. **103, 166, 171**

Serotonin A neurotransmitter with widespread inhibitory effects throughout the brain. It has a key role in aggressive behaviour. **16–17, 27, 37, 48, 54, 102, 111, 114, 208, 219–220, 231–233, 240–241, 248–249, 251–253, 292–295, 314, 316, 318, 328, 352, 361, 382, 384**

Sex The biological differences between males and females including chromosomes, hormones and anatomy. **18, 94, 107, 110, 112, 118–119, 121, 134, 140, 142, 147–156, 160–167, 169–171, 173–175, 278, 289, 293, 302, 307, 315, 336–337**

Sex-role stereotype A set of beliefs and preconceived ideas about what is expected or appropriate for men and women in a given society or social group. **148–149, 174**

Sexual selection An evolutionary explanation of partner preference. Attributes or behaviours that increase reproductive success are passed on and may become exaggerated over succeeding generations of offspring. **118–119, 122–123, 140, 142, 144**

Shift work A pattern of working through the whole of 24 hours where people change the time during which they work. **47, 55–56, 59**

Short-term memory (STM) The limited-capacity memory store. Coding is mainly acoustic, capacity is between 5 and 9 items on average, duration is about 18 seconds. **30, 82, 105, 115, 217**

Siffre, Michael **46–47, 50–51, 55, 59**

Sign test A statistical test for a difference in scores between related items (e.g. the same participant tested twice). Data should be nominal or better. **24, 62, 70, 74, 90**

Significance A statistical term that tells us how sure we are that a difference or correlation exists. A 'significant' result means that the researcher can reject the null hypothesis. **61–62, 71–76, 78–81, 85, 87, 90–91, 104, 138, 185, 192, 205, 214, 216–217, 282, 312, 323–324, 332, 347, 352**

Significance level The level of probability (p) at which it has been agreed to reject the null hypothesis. **72–73, 87, 90**

Similarity in attitudes We find partners who share our basic values attractive in the earlier stages of a relationship, so we tend to discount available individuals who differ markedly from us in their attitudes. **124, 140**

Single-blind procedure A type of research design in which a participant is not aware of research aims and/or of which condition of the experiment they are receiving. **69**

Situational explanation An explanation that identifies the causes of behaviour as existing within the environment, which may include other people. Such explanations are contrasted with dispositional explanations. **306–307, 315**

Skewed distribution A spread of frequency data that is not symmetrical, where the data clusters to one end of a continuum. **62, 71**

Skin conductance response (SCR) A physiological measure of the degree of sweating associated with arousal of the autonomic nervous system. ANS arousal activates the body's fight or flight response when a stressor occurs. Small increases in sweating can be detected as greater electrical conductance across the skin. **266–267, 276, 284, 287–288, 311**

Skinner, BF **8, 10–11, 26, 29, 81, 98, 101, 104, 110–111, 113**

Sleep/wake cycle A daily cycle of biological activity based on a 24-hour period (circadian rhythm) that is influenced by regular variations in the environment, such as the alternation of night and day. **43, 46–48, 50–52, 55–56, 59**

Slow wave sleep Also called deep sleep, a sleep stage during which growth hormone is secreted as well as other restorative activities. It is very difficult to wake someone up during this stage which occurs more at the start of the night than towards morning. **48, 59**

SLT *See* Social learning theory **12–13, 26, 162, 171, 228–229, 236–238, 248–249, 302–303, 309–310, 315, 317**

SNS *See* Somatic nervous system **34**

Social cognition Describes the mental processes we make use of when engaged in social interaction. For example, we make decisions on how to behave based on our understanding of a social situation. Both the understanding and the decision-making are cognitive processes. **177, 186–191, 195, 199**

Social construction The way we understand the world is created through the lens of cultural understanding. We do not 'see' what is really there. **153, 166–167, 170**

Social demography Demographics are features that describe populations, social demographics include geographical location and social class. Such factors filter out a large number of available partners. This means many relationships are formed between partners who share social demographic characteristics. **124–125, 140, 144**

Social desirability bias A tendency for respondents to answer questions in such a way that presents themselves in a better light. **25, 69, 86**

Social exchange theory (SET) A theory of how relationships form and develop. It assumes that romantic partners act out of self-interest in exchanging rewards and costs. A satisfying and committed relationship is maintained when rewards exceed costs and potential alternatives are less attractive than the current relationship. **126, 128, 130**

Social influences Behaviour related to social factors, such as family influences, peers and media advertising, and through processes of modelling and imitation (social learning theory). **110, 115, 170, 196, 228, 248**

Social learning theory (SLT) A way of explaining behaviour that includes both direct and indirect reinforcement, combining learning theory with the role of cognitive factors. **12, 162, 171, 228–229, 236, 302**

Social media **117, 134–135, 141, 145, 237, 305**

Social norms Something that is standard, usual or typical of a group. **83, 114, 119, 126, 130, 140–141, 148, 153, 164, 171, 236, 299, 304–305, 310, 315, 319, 358–359, 380, 384**

Social penetration theory **120–121, 140, 144**

Social psychological explanations of aggression Any theory that argues aggression is the result of an interaction between an individual's characteristics and features of the situations in which behaviour occurs. **300**

Social readjustment rating scale (SRRS) A self-report checklist measure of the stress associated with 43 life changes. Each one is linked with a number of life change units (LCUs) reflecting the degree of readjustment needed to cope with the change (e.g. 'Divorce' is 73 LCUs). **260, 266**

Social sensitivity Sieber and Stanley (1988) define socially sensitive research as, 'studies in which there are potential consequences or implications, either directly for the participants in the research or for the class of individuals represented by the research'. **106–107, 111**

Social support The word 'social' refers to other people, so social support is the assistance you get from others – friends, family, social influencers etc. **255, 261, 278–281, 285, 289**

Soft determinism The view that behaviour may be predictable (caused by internal/external factors) but there is also room for personal choice from a limited range of possibilities (restricted free will). **15, 23, 26, 98–99, 110, 113–114**

Somatic nervous system (SNS) Transmits information from receptor cells in the sense organs to the CNS. It also receives information from the CNS that directs muscles to act. **34**

Somatosensory area An area of the parietal lobe that processes sensory information such as touch. **38–40, 58**

Sources of stress Any feature of the environment that causes stress, including factors associated with work, everyday minor hassles and major changes in our lives. **255, 258, 260–265, 282, 284, 288–289**

Spearman's *rho* A test for a correlation when data is at least ordinal level. **62, 66, 70, 78–79, 84, 87**

Speech poverty A negative symptom of schizophrenia. It involves reduced frequency and quality of speech. **202, 206, 218, 222**

Sperry, Roger **40–41, 57–58, 104, 111**

Spinal cord Part of the central nervous system, a bundle of nerves from the brain transmitting nervous signals between the brain and the rest of the body. **34, 36–37, 54, 58, 257**

Spiral model of dieting **244–245, 249, 253**

Split-brain research A series of studies which began in the 1960s (and are still ongoing) involving people with epilepsy who had experienced a surgical separation of the hemispheres of their brain to reduce the severity of their epilepsy. This enabled researchers to test lateral functions of the brain in isolation. **33, 40–41, 54, 57–59, 104, 111**

SSRI *See* Selective serotonin reuptake inhibitor **37, 54, 233**

Stability In Eysenck's theory of personality, the opposite to neuroticism. **133, 156–157, 170, 172, 174, 329–330, 348, 352**

Stages of intellectual development Piaget identified four stages of intellectual development. Each stage is characterised by a different level of reasoning ability. Although the exact ages vary from child to child, the key point is that all children develop through the same *sequence* of stages. **117, 180–181, 194, 198–199**

Standard deviation A sophisticated measure of dispersion in a set of scores. It tells us how much scores deviate from the mean by calculating the difference between the mean and each score. All the differences are added up and divided by the number of scores. This gives the variance. The standard deviation is the square root of the variance. **24, 62, 71, 76, 85–86, 154, 179, 191, 207**

Standardisation Using exactly the same formalised procedures and instructions for all participants in a research study. **24, 45, 62, 105, 111, 138, 375**

Standardised instructions A set of instructions that are the same for all participants so as to avoid investigator effects caused by different instructions. **24, 81, 138, 163, 282–283**

Statistical significance *See* Significance **73, 90, 104, 282**

Statistical tests (also called inferential tests) Used in psychology to determine whether a significant difference or correlation exists (and consequently, whether the null hypothesis should be rejected or retained). **49, 53, 61–63, 66, 70–75, 77, 81, 85–86, 88, 90–91, 108–109, 123, 125, 138–139, 150, 167, 185, 192–193, 205, 216–217, 233, 239, 246–247, 267, 282–283, 295, 309, 311–313, 325, 341, 346–347, 367, 373, 378**

Strange Situation A controlled observation designed to test attachment security. Infants are assessed on their response to playing in an unfamiliar room, being left alone, left with a stranger and being reunited with a caregiver. **96, 103, 110–111**

Stratified sampling A sampling technique in which groups of participants are selected in proportion to their frequency in the population in order to obtain a representative sample. The aim is to identify sections of the population, or strata, that need to be represented in the study. Individuals from those strata are then selected for the study using a random technique. If the sample is not randomly selected from the stratum, it is then a quota sample. **91, 375**

Stress A physiological and psychological state of arousal that arises when we believe we do not have the ability to cope with a perceived threat (stressor). **23, 34–35, 37, 43, 47, 49, 79, 94, 98, 100–101, 108, 110–111, 114, 126, 139, 141, 152, 166, 203–204, 206–207, 210, 214–215, 218–219, 221–222, 227, 233, 240–241, 248–249, 251, 254–289, 293–294, 298, 315, 328–329, 338, 341, 345, 348–349, 356–359, 366, 375–376, 379–381, 383–385**

Stress (in relation to addiction) Stressful life events and traumatic experiences in childhood and adulthood are important risk factors for addiction. **358**

Stress inoculation therapy (SIT) Psychological method of stress management which helps individuals by first of all conceptualising the problem and identifying their own coping skills, then SIT aims to help develop new coping skills and finally exposes the individual to moderate amounts of anxiety to enable practice of coping. **274**

Stroop task/procedure The conflict experienced when trying to perform two conflicting tasks. Stroop found that participants were slower when naming the colours of a list of colour words when the colour and the word were in conflict ('red' written in orange ink) than when they were not in conflict ('red' written in red ink). This is because reading is an automatic activity. **217**

Structuralism Any theory that aims to study the relationship among phenomena rather than the phenomena themselves, and the systems formed by these relations. **8, 26, 82**

Structured interview Any interview where the questions are decided in advance, basically a questionnaire delivered by a person. **89, 156, 268, 283, 333**

Subcortex A description of parts of the frontal region of the brain that are not part of the cerebral cortex. They lie under the cortex. **204, 209, 218, 222**

Subjective From a personal view, likely to be biased. **8–9, 19–22, 26, 30, 39, 54, 65, 71, 74–75, 78, 83, 86, 90, 94, 103–105, 111, 113, 126–127, 131, 141, 151, 161, 173, 230, 261–262, 267, 284, 288, 327, 362, 374–375, 381, 385**

Summation The process that determines whether or not an action potential will be triggered, based on the combined effects of the excitatory and inhibitory signals of the neurotransmitters. **37, 54**

Superego The moralistic part of our personality which represents the ideal self – how we ought to be. **18–19, 21, 27, 94, 112, 114, 336–337, 349, 352–353**

Suprachiasmatic nucleus (SCN) An area of the brain located above the place where the optic nerves from each eye cross over (the optic chiasm). Plays a central role in regulating circadian rhythms. **43, 46, 50**

Survival of the fittest **30, 327**

Sutherland, Edwin **334–335, 349, 352**

Sympathetic nervous system A division of the autonomic nervous system (ANS) which activates internal organs for vigorous activities and emergencies, such as the fight or flight response. It consists of nerves that control, for example, increased heart rate and breathing, and decreased digestive activity. The sympathetic branch works in opposition to the parasympathetic branch of the ANS. **34–35, 256, 272, 310, 330**

Sympathomedullary pathway (SAM) This controls how the body initially responds to an acute stressor. The sympathetic nervous system triggers the fight or flight response. This includes the hormones adrenaline and noradrenaline which communicate with target organs in the body such as the heart. **256–257, 272, 288**

Symptom overlap Occurs when two or more conditions share symptoms. Where conditions share many symptoms this calls into question the validity of classifying the two disorders separately. **202–203, 218, 222**

Synapse The junction between two neurons. This includes the presynaptic terminal, the synaptic cleft and the postsynaptic receptor site. **17, 36–37, 54, 205, 208, 289, 316**

Synaptic cleft The space between the pre- and postsynaptic neuron. **205**

Synaptic transmission The process by which neighbouring neurons communicate with each other by sending chemical messages across the gap (the synapse) that separates them. **16, 33, 36–37, 54, 58–59, 209, 295**

Synaptic vesicles Small sacs on the end of a presynaptic neuron that contain neurotransmitters that will be released into a synapse. **37, 54**

Systematic desensitisation (SD) A behavioural therapy designed to reduce an unwanted response, such as anxiety created by a phobia, to a stimulus. SD involves drawing up a hierarchy of anxiety-provoking situations related to the phobic stimulus, teaching the individual to relax, and then exposing them to phobic situations. The individual works their way through the hierarchy whilst maintaining relaxation. **23**

Systematic sample A method of obtaining a representative sample by selecting every 5th, 7th, 10th or whatever person. This can be random if the first person is selected using a random method, then you select every 5th, 7th, 10th person after this. **271**

Table of critical values A table that contains the numbers used to judge significance (whether the null hypothesis can be rejected). The observed (calculated) value of the test statistic is compared to the number in the table (called the critical value) to see if the observed value is significant. **73–75**

Talking therapies **19, 27**

Target population The entire group a researcher is interested in, the group about which the researcher wishes to draw conclusions. For example, if a sample is taken from a group of men aged 30–60 living in London then the target population is London men in this age group and conclusions should only be applied to this target population. Usually researchers apply the conclusions to a wider population and then questions are asked about generalisability. **72, 81, 282–283**

Taste aversion An innate predisposition to learn to avoid potentially toxic foods, as signalled by a bitter or sour taste. **226–227, 246, 248, 250, 252**

Temporal lobe **38–39, 40, 54, 58**

Temporal validity The extent to which findings from a research study can be generalised to other historical times and eras. A form of external validity. **62, 68–69, 83, 86, 90, 151, 170**

Tend and befriend An adaptive response to stress for females, resulting in protection of offspring (tending) and relying on the social group for mutual defence (befriending). In contrast with the more male response of fight or flight. **94, 110, 114, 257, 278–279, 284–285**

Terminal buttons A swelling at the end of the axon. **36, 54**

Test–retest reliability A method of assessing the reliability of a questionnaire or psychological test by assessing the same person on two separate occasions. This shows to what extent the test (or other measure) produces the same answers i.e. is consistent or reliable. **66–67, 84, 86, 90, 151, 203, 218**

Testosterone A hormone from the androgen group that is produced mainly in the male testes (and in smaller amounts in the female ovaries). Associated with aggressiveness. **53, 113, 152–153, 155, 166, 170, 174, 279, 292–293, 314, 318, 330, 348**

Thalamus A structure in the centre of the subcortical area of the forebrain, one in each hemisphere. It has been described as the great relay station of the brain because most sensory information first goes to the thalamus, where it is processed and sent on to the cerebral cortex. **39, 54, 292, 318**

Thematic analysis An inductive and qualitative approach to analysis that involves identifying implicit or explicit ideas within the data. Themes will often emerge once the data has been coded. **62, 64–65, 86, 95, 111**

Theoretical models A representation of behaviour in abstract terms. **14** *Also see* Theory.

Theory A collection of general principles used to explain specific observations and facts. **16–17, 19, 21–23, 25–27, 30–31, 38–39, 53–54, 58, 62, 65, 68, 81–83, 87, 90, 92, 94, 102, 104, 106–107, 109, 111–112, 114–115, 117–122, 124–131, 134–137, 140–145, 147, 149, 153, 156–167, 170–171, 173–175, 177–180, 182–186, 188–190, 193–199, 206–207, 218, 221–222, 224, 226–229, 234–239, 242–249, 251–253, 257, 262, 269–270, 291, 297–298, 300–305, 309–311, 315, 317–320, 324, 326–327, 330–337, 346–354, 360–367, 374–375, 377–378, 380–382, 384–385**

Theory construction The process of developing an explanation for the causes of behaviour by systematically gathering evidence and then organising this into a coherent account (theory). **62, 82–83, 87**

Theory of mind (ToM) Our personal understanding (a 'theory') of what other people are thinking and feeling. It is sometimes called 'mind-reading'. **177, 188–190, 193, 195, 197, 199**

Theory of planned behaviour (TPB) Changes in behaviour can be predicted from our intention to change, which in turn is the outcome of personal attitudes towards the behaviour in question, our beliefs about what others think, and our perceived ability to control our behaviour. **354, 374–375, 377, 381, 385**

Three mountains task **80, 180–181, 186, 194, 199**

Thyroid gland A pair of small endocrine glands located in the neck that release hormones important for growth and the activity of cells in the body (metabolism). **35, 58–59**

Thyroxine One of the main hormones secreted by the thyroid glands, which controls metabolism. **35**

Time sampling A target individual or group is first established then the researcher records their behaviour in a fixed time frame, say, every 60 seconds. **25, 62, 65, 297, 365**

Token economies A form of behavioural therapy, where desirable behaviours are encouraged by the use of selective reinforcement. For example, people are given rewards (tokens) when they engage in socially desirable behaviours. The tokens are secondary reinforcers and can then be exchanged for primary reinforcers – food or privileges. **212–213, 219, 223, 340–341**

Tolerance A reduction in response to a substance, so that an addicted individual needs more to get the same effect. **356–357, 360, 380, 384**

Top-down approach Profilers start with a pre-established typology and work down to lower levels in order to assign offenders to one of two categories based on witness accounts and evidence from the crime scene. **320, 322–325, 348, 351–353**

Transgender Relating to a person whose gender identity does not correspond with their birth sex. **164, 166–167, 171**

Trauma **18, 23, 33, 41–43, 45, 54, 58–59, 64, 100, 110, 174, 205, 207, 214–215, 218–219, 223, 294–295, 306, 314, 329, 339, 356, 380**

Triangulation Comparing the results of two or more studies of the same thing to see if they are in agreement. This demonstrates the validity of the individual results. **69, 86, 90, 105, 111**

Turner's syndrome A chromosomal disorder in which affected women have only one X chromosome (denoted as XO), causing developmental abnormalities and infertility. **154–155, 170, 174**

Twin studies Research conducted using twins. Monozygotic (MZ) twins have the same genes whereas dizygotic (DZ) twins are about 50% similar genetically. It is presumed that all twins share a similar environment, so by comparing MZ and DZ twins one can conduct a quasi-experiment, where the independent variable is degree of genetic similarity. This means the influence of genetic factors can be assessed. **16, 107, 113, 171, 218, 221, 232–233, 240–241, 248–249, 251, 253, 294–295, 314, 328–329**

Two-tailed test Form of test used with a non-directional hypothesis. **73–76, 78–80, 85–87**

Type A personality Describes someone who is competitive, time-urgent (e.g. impatient) and hostile in most situations. Research has linked this personality type to coronary heart disease (CHD). **268–269, 288**

Type B personality Describes someone who is laid-back, relaxed and tolerant of others in most situations (i.e. the opposite of Type A). **268–269**

Type C personality Describes someone who is compliant, avoids conflict and suppresses their emotions, especially anger, in most situations. Some research has linked Type C with cancer. **268–269, 285**

Type I error The incorrect rejection of a true null hypothesis (a false positive). **62, 72–73, 87, 312, 328**

Type II error The failure to reject a false null hypothesis (a false negative). **62, 72–73, 87, 90, 312, 328**

Typical antipsychotics The first generation of drugs for schizophrenia and other psychotic disorders, having been used since the 1950s. They work as dopamine antagonists and include *chlorpromazine*. **208–209, 219–220**

Ultradian rhythm A type of biological rhythm with a frequency of more than one cycle in 24 hours, such as the stages of sleep (the sleep cycle). **33, 46, 48–49, 55, 59**

Unconditional positive regard Providing affection and respect without any conditions attached. **20–22, 27, 31, 104, 111**

Unconditioned stimulus (UCS) A stimulus that produces an innate (unlearned) response – the unconditioned response (UCR). **10, 29, 102, 111, 382**

Unconscious The part of the mind that we are unaware of but which directs much of our behaviour. **8, 18–19, 23, 27, 31, 67, 69, 98–99, 110, 113, 159–161, 173, 175, 336–337, 349**

Unfalsifiable **27** *Also see* Falsifiability

Universality Any underlying characteristic of human beings that is capable of being applied to all, despite differences of experience and upbringing. Gender bias and culture bias threaten the universality of findings in psychology. **94, 96–97, 110, 114**

Unrelated Two (or more) sets of data are independent. **42, 45, 61–62, 70–71, 74, 76–77, 80, 85–88, 90–91, 154, 328**

Unrelated *t*-test A parametric test for a difference between two sets of scores. Data must be interval with an unrelated design, i.e. independent groups. **42, 62, 70–71, 76–77, 85, 88, 91, 328**

Unstructured interview The interview starts out with some general aims and possibly some questions, and lets the interviewee's answers guide subsequent questions. **89, 104, 119, 229, 237, 277, 371**

Validity The extent to which an observed effect is genuine – does it measure what is was supposed to measure, and can it be generalised beyond the research setting within which it was found? **15, 21, 26, 39, 51, 55, 61–62, 64–65, 68–69, 83–84, 86–87, 89–91, 96, 103, 105, 108, 121, 123, 125, 127, 129, 131, 135, 137, 145, 151, 161, 170, 185, 187, 189, 194–195, 197, 202–203, 218, 220, 231, 233, 235, 237, 241, 248–249, 257, 261, 263, 265, 267, 271, 284, 293, 295, 299, 301, 305, 307, 309, 315, 317, 323, 339, 367, 373, 375, 377, 383**

Variable ratio In operant conditioning when a reward is delivered at intervals that change each time rather than the same interval everytime, for example every 15 seconds. **11**

Variable reinforcement A type of partial reinforcement in which a behaviour is reinforced after an unpredictable period of time or number of responses. **364–365, 380, 384**

Ventral striatum Major portion of the basal ganglia and functions as part of the reward system. It includes the nucleus accumbens. **205–206, 218**

Vicarious reinforcement Reinforcement which is not directly experienced but occurs through observing someone else being reinforced for a behaviour. This is a key factor in imitation. **12, 26, 30, 113, 162, 171, 175, 228–229, 236, 248–249, 302, 309, 315, 317–318, 353, 364–365, 380, 382, 385**

Video games *See* Computer games **11, 13, 308–311**

Video nasties **13**

Violation of expectation research A method used to investigate infant knowledge of the world. The idea is that if children understand how the physical world operates then they will expect certain things to happen in particular situations. If these do not occur and children show surprise, this suggests that they have an intact knowledge of that aspect of the world. **184, 194**

Visual area A part of the occipital lobe that receives and processes visual information. **38–40, 50, 54, 56**

Volunteer sample A sample of participants produced by a sampling technique that relies solely on inviting people to take part. **88, 125, 233, 241, 245, 263, 279, 363, 379**

Vygotsky, Lev **177, 179, 182–183, 194, 196, 198–199**

Watson, John B. **8, 10, 26, 30, 240, 249**

Weapons effect The presence of a weapon may act as a cognitive trigger and lead to increased aggressiveness. (Not the same as the weapon focus effect where an eyewitness may focus on a criminal's weapon and therefore not be able to later identify their face.) **300, 315**

Wernicke's area An area of the temporal lobe (encircling the auditory cortex) in the left hemisphere (in most people), responsible for language comprehension. **38–40, 54, 58**

Wilcoxon A test for a difference between two sets of scores. Data should be at least ordinal level using a related design (repeated measures). **61–62, 70–71, 74–76, 85, 87, 90–91**

Withdrawal syndrome A set of symptoms that develop when an addicted person abstains from or reduces their substance abuse. **356–357, 362, 368, 380, 384**

Working memory An area of memory that deals with information that is being worked on, equivalent to short-term memory. It is divided into separate stores representing different modalities. **14, 45, 103**

Workload The amount of time/effort required in a job. Can refer to underload as well as overload, but is usually taken to mean the latter. **264–265, 284, 288**

Workplace stress Sources of stress that people experience in relation to their job. **255, 258, 264–265, 284, 288–289**

Wundt, Wilhelm **8–9, 26, 28, 30, 82**

Yerkes-Dodson Law Describes the curvilinear relationship between arousal and performance. When arousal is very low or very high, performance is poor. Performance is highest at a medium level of arousal. **24**

Zone of proximal development (ZPD) This is the gap between a child's current level of development (defined by the cognitive tasks they can perform unaided) and what they can potentially do with the right help from a more expert other (an adult or a more advanced child). **182–183, 194, 196**

Acknowledgements

pp10 (both); p12 (right); p15 (bottom); p19; p20; p22; p26–27; p35; p36 (both); p37 (top); pp40–41; p44D; p48; pp60–61; p63; p154; p180; p184; p188; p192; p195; p204; p205; p208; p256; p257; p296 © Illuminate Publishing

pp74–76, 78–80 critical values tables: Coolican, H. (2019) *Research methods and statistics in Psychology* (7th edition). London: Routledge.

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The back page



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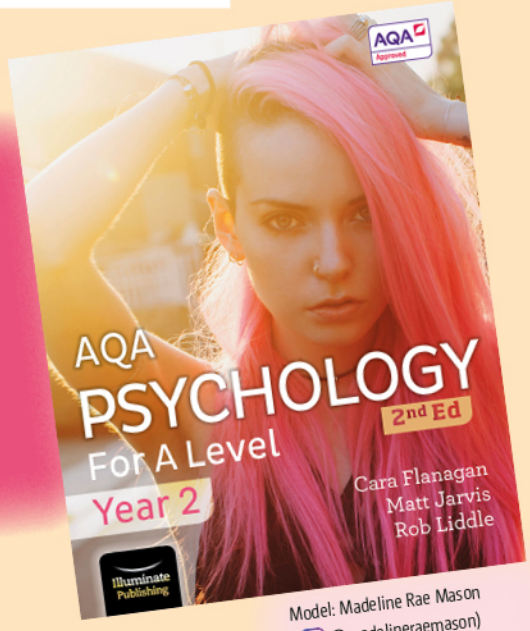
Cara has written many books for A level Psychology and is senior editor of *Psychology Review*. She speaks at and organises student conferences. In a previous life she was a teacher probably for more years than you have been alive. Her spare time (what there is of it) involves her husband and children (now over 20 years old), pubs and mountains, preferably on the same day.

Rob was an A level teacher for more than 20 years and would like to give a big shout out to his ex-colleagues at Winstanley College in Wigan. In his spare moments, he likes nothing more than to pluck away tunelessly at his guitar, ideally in the Lake District. He plans to ask Matt how you become a Chartered Psychologist. In an eerie echo of the first edition of this book, he still hasn't seen *Frozen 2*.

Matt is a Chartered Psychologist and Associate Fellow of the British Psychological Society. He taught psychology for 25 years and is currently Learning Technology and Innovation Manager for a Social Justice and Education charity. Matt is also an editor of *Psychology Review*. When not working or writing, Matt DJs and loves live music and festivals.

About the cover:

Madeline Rae Mason is the model gracing the front of our cover once more. **Jason Duda** took this incredible photo. They both live and work in Sydney, Australia and we thank them both for helping to give this series such a strong and memorable identity.



Model: Madeline Rae Mason (@madelineraemason)
Photographer: Jason Duda (@jasondudaphotography)